CHEMICAL MARKETS

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Signs of Spring

WHAT the market reporters call "better inquiry" seems to have been definitely established as an encouraging symptom of the recovery of chemical business. "One swallow does not make a summer," and this recent buying might be interpreted as the perfectly natural reaction from the regular December habit of industrial consumers who seek to cut down raw material stocks with the object of making their inventory figures as favorable as possible. Certainly this motive would be very forceful this year: but there are other signs that trade is convalescent.

SEVERAL most important consuming industries are coming out of the coma. Most particularly notable is the activity in the textile industry. This recovery, on the theory that the first down should be the first up again, assumes considerable importance.

MORE deeply significant, however, is a financial symptom which has missed the attention it deserves. On Christmas Eve the New York Reserve Bank rate fell to two per cent: the lowest in the sixteen years history of the Federal Reserve System. Ten days later the same rate was announced by the Bank of France: the lowest established by any important European central bank since February, 1894, by the Bank of England. Then, as now, this abnormally low rate followed a severe and protracted period of business stagnation marked by a precipitous decline in commodity prices.

THEN—and by analogy we may expect a similar sequence—this extreme cheapness of money marked the low point of the depression. Prices of staples then ceased to decline and business moved forward again. This revival was greatly stimulated both by cheap money and low-cost raw materials.

HERE is the sign we have been eagerly awaiting for several months. But even now, if we face facts squarely and seek sound economic conclusions, we must remember three points:

FIRST, the two per cent rate of 1894 initiated a revival of business that became general not till twelve months later.

SECOND, the Bank of England maintained this low rate for two and a half years: an example to the financial powers of our country and France who are now, as England was then, custodians of the world's chief gold reserves.

THIRD, chemical values did not advance generally from the lower levels established during the decline of the 90's till the World War: a warning to chemical executives who cheerfully plan to advance prices upon the first return of any considerable demand.

N.R.M.S.

NORTH ROCKY MOUNTAIN STATES

A rugged country, with industries which express its tempo. The supply base for huge reserves of wheat . . . . water power . . . . copper . . . . meat.

And "American" Alcohol, with plants nearby, plays a part in the development of industry in the North Rocky Mountain States.

"SEE AMERICAN FIRST"

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Baltimore, Md.	Memphis, Tenn.
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MANY things go to make a reputation in business . . . but none so indispensable as good raw materials . . . especially where the raw material is alcohol.

When "American" Alcohol is used, its steady, uniform quality will be reflected in your production. And supplementing this quality are efficient service, trained personnel, controlled manufacture, adequate distribution.

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COMMERCIAL ALCOHOL
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Wickersham Report Prohibition has slipped further into the slough of blind, uncompromising partisanship. Political, social, and semi-religious prejudices join to cause further delays in any intelligent, unbiased solution of this vexing problem, and unfortunately the Wickersham Report sheds little light that will help to clarify these dark phases of public opinion.

With the broad aspects of prohibition CHEMICAL MARKETS, as a business paper, is not directly interested. When the National Commission on Law Enforcement, however, suggests further and more radical supervision of the users of industrial alcohol then the welfare of the industry is jeopardized, and we are deeply concerned.

Manufacturers, jobbers, and users of industrial alcohol have submitted in a splendid spirit of co-operation to the introduction of new and in many ways very radical changes in methods of regulation and supervision. These were supposed to be the last word—the result of ten years of practical study of the problem. Must further submission of legitimate business be made to satisfy the hunger of bureaucracy and of prejudice? Alcohol regulations at many points usurp individual rights to operate a legitimate business. The alcohol industry is hampered at every turn. And apparently with little result in attaining the object sought.

In this respect, at least, the Wickersham Report sections dealing with the illegitimate sources of supply deserves a careful reading by the Prohibition officials. While estimating a diversion of 9,000,000 proof gallons from industrial to bootleg channels, the Commission made plain their belief that re-naturing was a comparatively unimportant source of supply. This is refreshing. For it has so frequently been held in Prohibition circles that our alcohol manufacturers were almost wholly responsible for the flood of more-or-less potable liquor which has made anything like national enforcement a farce. With the facts of the Wickersham Report as a text the alcohol industry might well do a little plain speaking in their own defense, the next time they are called up on the carpet to be further harassed by costly—but ineffective—regulation.

A Foreign Viewpoint "Is the American alkali industry over-producing?" This timely, important question is asked by "The Chemical Trade Journal" of London editorially. To quote further, "We are prompted to ask this question by recent reports of a serious price break in soda ash and caustic soda and by the publication by the Bureau of the Census of the production figures for 1929."

We refuse to become terribly concerned over the figures that reveal the rapid growth of production capacities of alkali plants in the past ten years, nor with the thinly veiled conclusion arrived at in the editorial that we are in need of regulation.

Obviously we are not faced with any immediate domestic shortage of alkali. On the other hand, there was no effective surplus production in 1928 or 1929. On several occasions before the industry has been faced with a real problem of surplus and in each instance survived to grow even to greater proportions. What was thought to be a capacity much too large for our peace-time needs in 1920 proved entirely inadequate for the demands made upon it by the rayon, the plastics, and the oil refining industries. What we really need is a little faith in the future. In spite of the developments in ammonia and lime, the constructive chemical expansions of the past ten years will appear to be but trifles when comparison is made ten years hence.

Nor do we believe that American alkali will be driven out of the South American markets and we are inclined to think that it will gain an even greater foothold in the Orient. We should remind our British contemporary that even before the recent price reductions ash and caustic sold lower in the United States than in Great Britain, and the differential has been increased.

An Authority Speaks Few men are in a better position than Paul M. Warburg to speak authoritatively on business and finance. Not alone is his outstanding ability recognized, but his courage as well. Two years ago he almost alone decried the speculative debauchery, at a time when many financial and business leaders were willing to cater to the mob, content to echo the claptrap of Wall Street about new theories of value and "the new economic era."

His recent pronouncement on the business situation is equally refreshing and impressive: "It is a strange spectacle to see the very people who two years ago preached the gospel of the endless spiral of mounting wages and prices, the advocates of the new era of endless prosperity, now wedded to visions of an endless adversity and decline. Nobody may venture to predict when this depression will end, but no sane person doubts that

eventually it will end, and that a country as unique in resources and opportunities as ours will ultimately get back into its stride. Comparatively brief periods of underproduction in a country containing over 120,000,000 temperamentally enthusiastic consumers must bring about a certain revival of business activity."

His remarks on commodity prices are of peculiar significance to us. "While many observers, perhaps a majority, seem to look upon the present drop as something unnatural, there is much room for the belief that the present range of prices—though in many cases, no doubt, recessions have gone too far—may be nearer the natural level than that from which we came. The harm does not lie in lower prices, but in the violence of the change."

The economic justification for the two principal trends of the past decade in our industrial life, mass production and consolidation, ultimately lie in lower prices and shorter hours of labor. Yet, with a blindness matched only by cupidity, many executives are now making desperate efforts to stay the effects of the movement we set out deliberately to create. Undoubtedly the change, as Warburg points out, came with unexpected violence; but that it would eventually come was as simple as two times two makes four. Perhaps the very obviousness of this underlying logic makes it obscure.

A New Balance Wheel

In November of last year CHEMICAL MARKETS said in an editorial: "While we are in the midst of the usual contract season it is well for sellers and buyers to remember that whatever price action is taken now, will exert a control over conditions, not for a week, or a month, but for an entire year. It would be unfortunate for all if the weakness of a few should lead to market demoralization. Chemical values are not inflated and have not been for many years. Therefore, any drastic reductions will certainly be a bear raid rather than a logical readjustment of prices." Not the words of a prophet, but merely the logic of whoever has lived through similar market situations in the past.

The recent unpleasantness is reported as being over. The barn door is once more locked, but after the horse is gone. Chemical executives will not be solaced by the efforts of Wall Street statisticians to figure out for present and prospective stockholders the cost of our recent price wars. For perhaps the first time prices of chemical stocks have moved distinctly against a general upward trend of the securities market. Certainly for the first time the general public has shown a lively interest in chemical quotations.

We have rejoiced in the greater participation of the public in the ownership of chemical securities, and a perfectly logical result of this public ownership was the prompt reaction in Wall Street to the widespread and drastic price reductions that marked the closing weeks of the contract season. This was a novel and unpleasant experience, but salutary. For, if the industry is to hold the confidence of the investing public it must so govern itself as to warrant the respect of the business and financial communities.

Quotation Marks

Chemistry is a creative science, and the first chapter of its Book of Genesis is not yet written.—*Arthur D. Little.*

What economic reason can there be for the insistent proposals that the government either directly or through subsidy to a private concern shall engage in the manufacture of nitrogen and fertilizers?—*The Fertilizer Review.*

As a matter of fact, the problem of unemployment has been in the making for decades. The only new thing about it is that, in past years, it has been classified under some such heading as "technological unemployment" and left to the tender mercies of students and economists, whereas in 1930 it has become a personal and dramatic problem to the average citizen.—*Textile World.*

Intelligent buying will be the key to success in most organizations, and those who underrate its value will suffer. Although many commodities are now sold below cost, some will go even lower and others are due for an advance. Inventory shrinkage is the great enemy of profits and intelligent study of market conditions can and does reduce this shrinkage.—*George A. Renard, National Association Purchasing Agents N. Y. Times.*

Fifteen Years Ago

(From our issues of February, 1916)

The Solvay Securities Company is dissolved and the assets distributed to the stockholders.

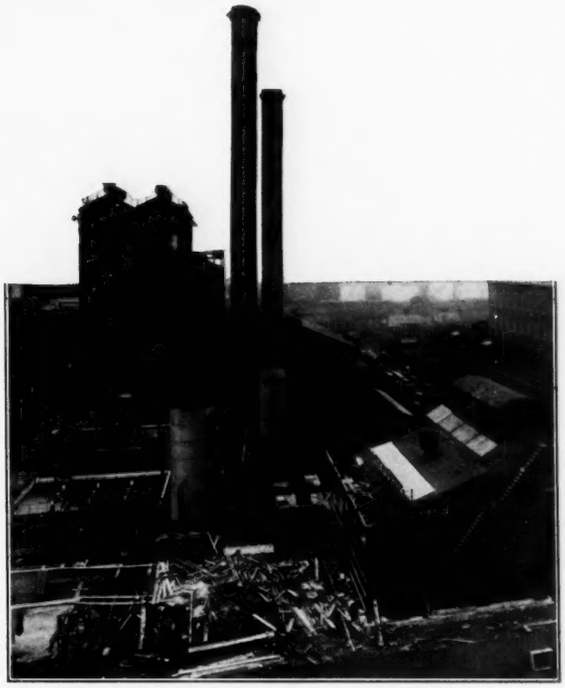
Fire destroys part of the Baugh Chemical Company's plant in Baltimore.

Commissioner Kramer of the prohibition department publishes new restrictions on sale of industrial alcohol.

H. B. Rosengarten, president Powers-Weightman-Rosengarten dies at the age of eighty-four years.

Peter Van Schaack & Sons purchase new plant in Chicago.

M. D. Curwen* Reviews the British Chemical Industry



New synthetic acetic acid and solvent plant of The Distillers Co. Ltd., Hull, England

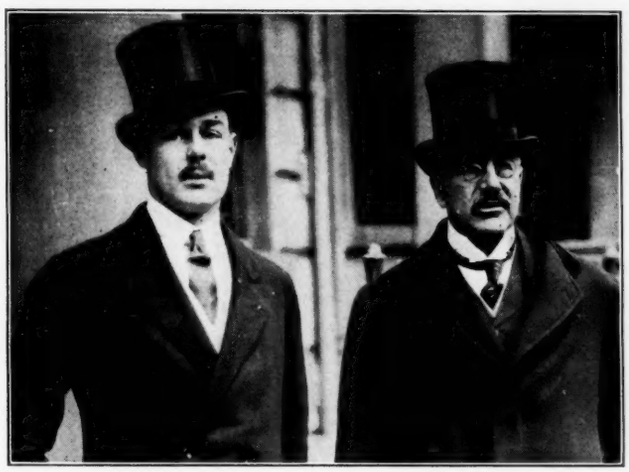
THE death of Lord Melchett has overshadowed all other happenings of the past year. Although not a chemist, without doubt he did more for the chemical industry in this country and for the chemist than any man ever did, by his amazing energy in creating an organization powerful enough to ensure the importance of Great Britain in the industrial chemical world, by utilizing chemical and other scientific workers to an extent hitherto undreamed of in this country, and by preaching so energetically the gospel of research in every branch of industry.

We shall not say he is irreplaceable; he himself would have denied it strenuously, but for the time being, so great was his personality, that it is difficult to see another to replace him in the place he held in the scientific councils of this country.

The chairmanship of Imperial Chemical Industries Ltd. now passes into the able hands of Sir Harry McGowan.

That chemical events should be discussed in the daily papers is a remarkable state of affairs. That they should be the subject of a heated debate in Parliament and in the House of Lords, that they should be the cause of nearly overthrowing the existing Government, borders on the miraculous. But the Dyestuffs Act has accomplished all these things. Professors of chemistry have written to the "Times" about it and Low has made it the subject of a brilliant cartoon in the "Evening Standard." The Act, in view of the vigorous stand made by the Lords and the Protectionists in the House of Commons, will not expire in January 1931. A year is to be allowed to collect sufficient evidence to discuss the matter properly. That the Dyestuffs Act which protects an industry of fundamental importance to the country in peace time as in war, should be allowed to lapse sounds almost incredible, and that a noble Free Trade Lord should in the Upper Chamber state that in his opinion the industry would have gone on quite well without the act and so far as research was concerned, he believed they might have done much better, is enough to make the gentlest scientist foam at the mouth.

*Editor "The Industrial Chemist"



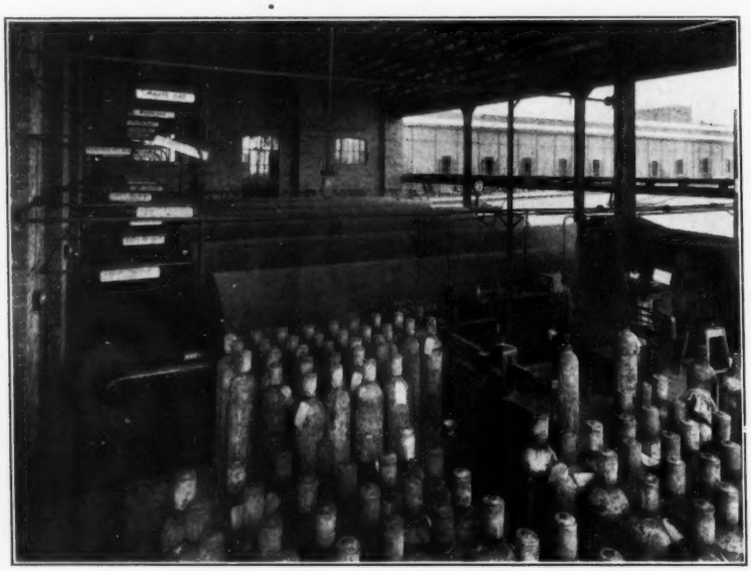
Hon. Henry Mond and the late Lord Melchett

Chemical Industry Diversified

The chemical industry taken generally has felt the trade depression much less than any other, because it covers such a wide field of activities, including those in which there has been no lack of work. There has been a considerable lag in time before the full force of bad trade has been felt and there is no reason to suppose that there will be a corresponding lag when trade brightens.

A broad view of how the chemical industries have been adversely affected is obtained from an examination of the tables given below, which have been compiled from the Board of Trade returns. A detailed examination of the monthly returns of exports and

imports shows us that with very few exceptions, trade began well during the opening months and steadily declined towards the end of the year. With two exceptions only, a decline in both imports and exports of all important commodities is noticed. Exports of bleaching powder have recovered from a slight setback received the previous year, and imports of borax have increased to nearly double the amount imported in 1929, due to the widespread increase in its use in glass and leather manufacture. Exports in ammonium sulfate have decreased considerably owing to the world depression in agriculture and in part, we presume, to the agreement recently signed by the European synthetic ammonia and Chilean nitrate producers whereby Great Britain for a twelve months' trial, reduces her production by 50 per cent.



Chlorine storage and loading station, Staveley Coal and Iron Co., Chesterfield, England

Coal tar exports are down again, the main offenders being tar and creosote oils. Wood preserving on the whole is decreasing, railway sleepers of wood, for example, being increasingly replaced by metal sleepers. If the new method of wood impregnation with synthetic resin worked out at the University College of London University and now being described in this journal, is successful, the creosote industry will suffer still further. On the other hand, the industry of tar distillation for the production of phenolic bodies should receive a fillip. Incidentally the Wood Preservation Association was formed early this year with the object of spreading knowledge regarding wood-preservation and investigating all methods of preservation, so that further developments will be watched with interest.

Imports of acetic acid have declined very seriously and the reason may be placed partly at the door of the decreased acetate silk production and partly to the welcome introduction of the manufacture of glacial acetic in this country by the United Alkali Co. and this year by British Industrial Solvents, Ltd. at their new works near Hull.

It will be seen from the tables that whereas imports depreciated over 19 per cent compared with those during 1929, exports (which does not include re-exports) declined 15 per cent.

Heavy Chemicals

The production of sulfuric acid during 1930 is estimated to be about 850,000 tons of 100% acid which is nearly 100,000 tons less than last year's production, and 50,000 tons less than the 1928 production. How much of this decline can be attributed to bad trade in other industries may be judged from the fact that sulfuric acid is replacing hydrochloric acid in many pickling operations which originally employed the latter acid, mainly because of better control of operations and ease of storing, that the superphosphate industry has if anything improved its production, and the motor and radio industries are by no means depressed.

An important occurrence in this particular industry is the reconstruction of Chemical and Metallurgical Corporation, Ltd., which is meeting with considerable

Exports* for 11 Months Ending November 30
Value in Pounds Sterling

Commodity	*1929*	*1930*	*Increase or Decrease*
Sulfuric	49,300	38,900	—10,400
Amm. Sulf.	4,790,100	4,179,800	—610,300
Bleaching Powder	171,200	174,200	+3,000
Coal Tar Prod.	1,544,900	1,091,200	—453,700
Cop. Sulf. & Disinfect.	1,924,300	1,726,800	—197,500
Potassium Comp.	189,300	177,800	—11,500
Sodium Comp.	3,538,900	3,027,500	—511,400
Other Chem.	3,475,800	2,979,600	—496,200
Drugs, Medicines, etc.	3,004,100	2,612,100	—392,000
Dyes	1,012,700	909,000	—103,700
Paints	3,692,100	3,024,600	—667,500
Total	24,048,000	20,447,200	—3,600,800

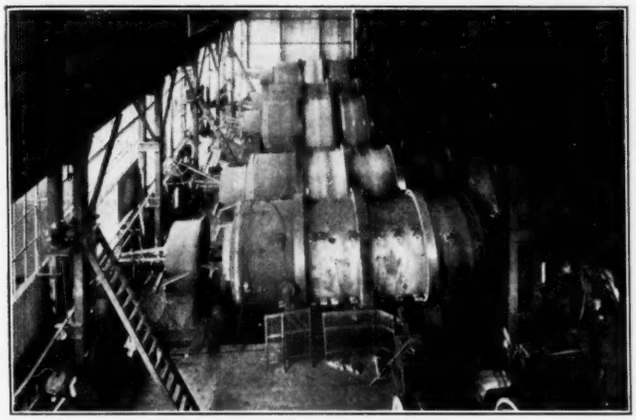
Imports* for 11 Months Ending November 30
Value in Pounds Sterling

Commodity	*1929*	*1930*	*Increase or Decrease*
Acetic	715,200	356,500	—358,700
Borax	65,600	122,900	+57,300
Coal Tar Prod.	355,900	290,000	—65,900
Potassium comp.	1,242,200	1,039,800	—202,400
Sodium comp.	1,052,900	614,200	—438,700
Drugs, Medicines, etc.	2,315,802	1,938,756	—377,046
Dyestuffs, dye extracts and intermediates	1,232,300	1,198,700	—33,600
Painters Col.	2,070,900	1,905,500	—165,400
Total (incl. drugs)	15,374,800	12,430,900	—2,943,900

*Eleven months figures. Value in pounds sterling.

success. The new virile managership is producing good results (a small profit has now been made) and in addition to all strengths of sulfuric acid commercial and pure, hydrochloric acid, sodium sulfate and an excellent red lead are produced. The Astmoor works are working at about 50 per cent capacity. In passing, it would appear that the end of the small acid manufacturer is approaching.

Production of sulfuric acid from the smelters of zinc concentrates in Wales shows no diminution. It is interesting to note that the National Smelting Co. of Avonmouth is about to introduce a further battery of



A battery of Coley zinc extraction plants in operation at Dartford, England

Dwight Lloyd sintering machines each with a capacity of 500 tons of zinc blende (containing about 30 per cent sulfur.)

The metal and metal refining industries have with low prices suffered considerably. Platinum touched phenomenally low values, which probably prevented wider-spread exchange of platinum for the new vanadium catalysts in contact sulfuric acid manufacture. The position of zinc and spelter has prevented wider developments of the Coley process for zinc production and tin is so low that a new process for the recovery of tin from tinned plate is being held up. The low price of silver, on the other hand, has proved a boon to sundry chemical manufacturers and has enabled some to install chemical plant made of silver. There is obviously an advantage in utilizing this metal when the "scrap" value is so high and when the price of silver will probably rise.

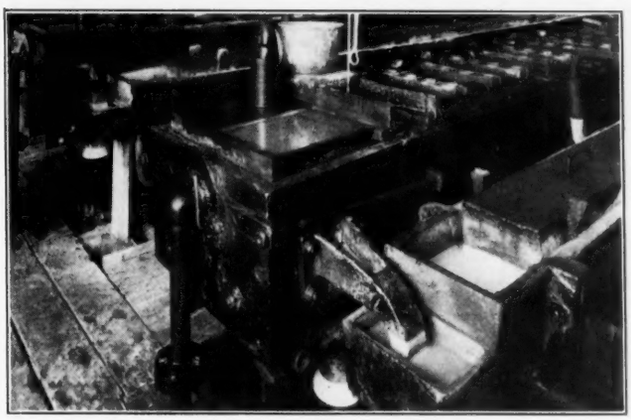
In the metal industry perhaps the most important event in construction has been the new works of Messrs. Henry Wiggin & Co. in Birmingham. The separate factories have now been remodelled and manufacture reorganized into easily controllable units.

Construction During 1930

Expansion of Imperial Chemical Industries included new plant for the manufacture of acetic acid from acetylene and of ethyl, methyl, and methylene chlorides. The works of British Industrial Solvents, Ltd., a branch of the Distillers Company, in addition to glacial acetic acid are now producing acetone, amyl alcohol, amyl acetate, butyl acetate, butyl alcohol, butyl lactate, diamyl phthalate, dibutyl phthalate, ethyl acetate and other industrial solvents.

The differences between the Distillers Co. and Solvent Products, Ltd., which had lead to a price "war", have now happily been settled. The plant of the latter company at Dagenham has been increased and the output doubled. In addition to mineralized and methylated spirits, power alcohol and doubly rectified spirit Solvent Products, Ltd. are now producing absolute alcohol.

The tar distillation and gas industries are regarding sundry improvements with interest. For example tar precipitation by electrical methods as exemplified by the Simon Carves and Lodge-Cottrell precipitation plants, is spreading, as is the installation of the comparatively new Wilton plant for the removal and drying of ammonium sulfate. Gas manufacturers are carefully examining the installations of the activated carbon process for the recovery of benzol that were built last year. The British Carbo Union has now begun the erection of a large carbon plant for this purpose at the Beckton works of the Gas Light & Coke Co. This company has within the last two or three years installed recovery plant in a celluloid factory, a dry-cleaning works, two rubber factories and an artificial silk works. It has now taken up the treatment of municipal water supplies for the removal of chlorine, and colouring matter, etc. Many gas companies have also installed the Holmes process for drying towns gas with $CaCl_2$.



View of the cell room in the Dartford zinc plant

The Staveley Coal & Iron Co. completed their new synthetic hydrochloric acid plant, expanded considerably the number of mercury cells for the production of caustic soda, hydrogen and chlorine and installed a large liquid chlorine plant. The history of this firm has been one of continued success.

A very fine new plant thrown open in July to the view of a large scientific circle was that of Steatite & Porcelain Products, Ltd. at Stourport, Worcestershire. Originally producing magnesia rings and

nozzles for the incandescent mantle industry, the business has now been extended to include all ceramic insulating products. The works, which is a model of what such a factory should be, possesses one of the finest high-tension research laboratories in the country.

The difficulties of the Zinc Manufacturing Co., Ltd. working the Coley process of zinc extraction, due to the present price of spelter, have already been indicated. Nevertheless this has not stopped the firm from improving the process. There are now six furnaces at the Dartford works, and a plant of 12 cylinders is nearly complete in Djebel Djellond, Tunisia, where there are available large quantities of calamine.

Artificial Silk

The large drop in production of artificial silk has produced its effect on the chemical industries which supply such large quantities of the raw materials. Even with decreased production, the consumption is so much lower that steps have been taken by European and American manufacturers to stabilize the industry.

At a recent meeting of the Apex Artificial Silk Co. it was recommended that the company be wound up. British Visada report a small loss, but the Loughborough works are apparently working full time. Proposals to wind up British Acetate Silk Corporation, Nuera Art Silk Co. and Scottish Artificial Silks, Ltd. have been made, and attempts to reconstruct Atlas Artificial Silk Processes and British Acetate Silk Co., Ltd. are being made. British Bemberg, Ltd. are building a new factory at Doncaster.

The new works of Transparent Paper, Ltd. at Bury is said to be turning out viscose and, acetate paper successfully and it is proposed to extend the viscose plant.

Safety glass, which may conveniently be included in this section, has made little progress. Several new firms are doing badly. If we may make a prophecy in this extremely interesting but technically difficult industry, it is, that the only firms who will succeed are those who are willing to accept the fact that chemical and physical research are fundamental to the industry. In passing it is interesting to hear that one of the main problems, namely the cause of discolouration of the celluloid, has been solved by the research work instituted by two large firms in this country, who are vitally concerned in the manufacture of the raw material.

The Financial Situation

Financially 1930 has been notable chiefly for the elimination from the field of a number of companies formed during the boom period. The lowering of prices of artificial silk by the big producers hit some of the newer firms very hard and a number have ceased to produce during the year. In many other kinds of business, firms had arisen which had not fully realized the amount of work to be done and money to be spent before their processes could be put on a profit-making basis. As an example we may mention the safety glass industry. Several of the newer firms in this business have ceased operations but the position of the Triplex Company (the oldest and largest firm in this country) appears more secure than ever before. There is little doubt but that this survival of the fittest will prove of great benefit in the period of increasing prosperity which we believe is before the nation as a whole.

The policy of rationalization has made continued progress more especially in the iron, steel and colliery industries and, even though in some instances this has caused a temporary increase in unemployment it is hoped that the increased efficiency so obtained will result in increased business and employment.

A number of low temperature carbonization companies have started or increased production during the year, but the financial reports so far received do not exhibit any particularly striking figures. In business of this kind the amount of detail work required is, of course, enormous, and the new prevailing prices of by-products have hindered satisfactory financial progress even in those cases where the technical progress has been satisfactory.

Imperial Progress Unchecked

The progress of Imperial Chemical Industries has so far continued unchecked, the profits for 1929 being more than £500,000 above those for last year. Large orders have been placed with this firm by the Soviet government and credit arrangements up to £12,000,000 made.

Another important step towards rationalization was acquisition by the United Molasses Company of a substantial interest in Solvent Products, Ltd. an independent firm of industrial alcohol producers. In the same way the British Oxygen Company and Allen Liversidge have recently joined forces, and Alloy Welding Processes, Ltd. has been acquired by Murex, Ltd. The American Procter and Gamble Company has also acquired control of one of the largest independent soap factories in the North of England. Blair, Campbell & McLean, Ltd. the well known chemical engineering firm of Glasgow have taken a controlling interest in the Harvey Engineering Co. and are now known as Blairs, Ltd.

British Chemical Equipment Exhibit

London—The British Chemical Plant Manufacturers' Association has decided to stage, in cooperation with the Chemical Engineering Group of the Society of Chemical Industry, an exhibition which will be open during the entire week of July 13 to July 18 inclusive. The Central Hall, Westminster, has been selected for the purpose in view of its convenient position, and the exhibiting area will be twice as great as in 1926.

The Exhibition will cover all types of plant, apparatus, instruments, construction materials and general equipment required by the chemical industry and the numerous other branches of industrial activity associated with it. Only makers of British plant equipment will be eligible to exhibit.

Growth of Italian Chemical Industry Continues

By Dr. Massimo Treves*

ITALY, courageously facing the gravest difficulties, was able to maintain in 1930 an efficient pace in its production activities, particularly in the chemical industry which operated satisfactorily.

The capital invested in the Italian chemical industry is around 3,000,000,000 Italian Lire. There are approximately 3,500 firms in connection with the chemical industry which give work to 85,000 workmen. Not included in these figures, are the rayon factories, which form a special group with a capital of 2,000,000,000 Italian Lire.

However, some degree of depression is to be noted in these fields (chemical and rayon) because of the less favorable conditions of many industries using chemical products and as a result of the decrease in the direct consumption of various products.

The following statistical data does not refer to the whole of 1930, but is an indication of the situation.

Metal Production Figures

The production of metal during the first ten months is as follows:

Copper: tons—	317	Mercury: tons—	1,598
Lead: "	18,003	Zinc: "	12,871
Aluminum: "	6,255		

The total production of the superphosphate industry in the first nine months of this year was 10,900,766 quintals with a difference in excess of 1,588,236 quintals as compared to the production during the same period in 1929. Even during the first nine months of 1930 production reached a figure of 520,966 quintal of sulfate of copper: 26,739,714 quintals of cement: 2,572,452 quintals of paper and cardboard.

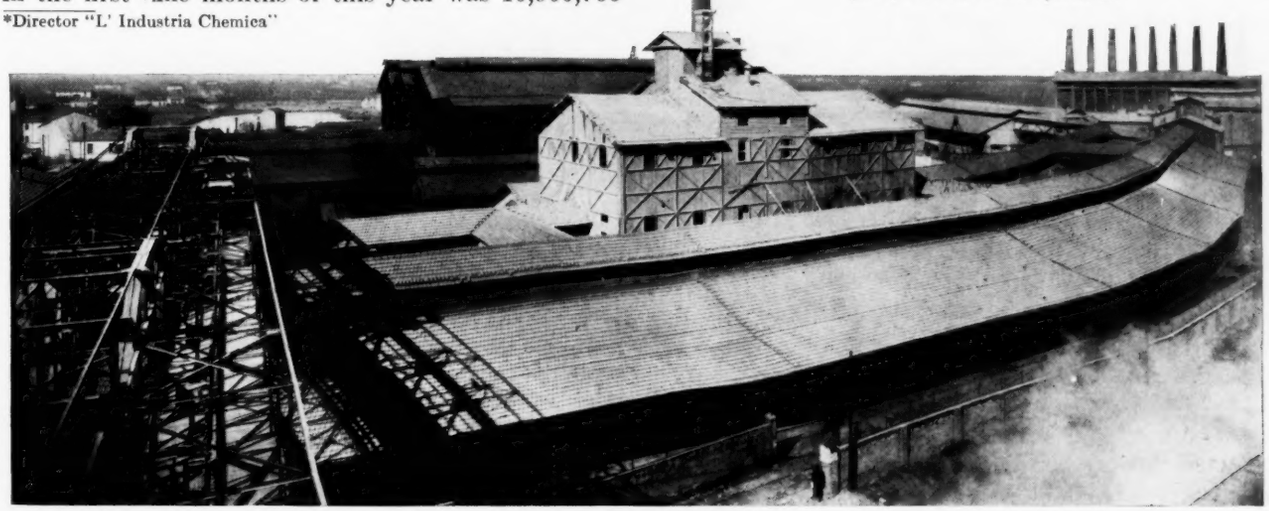
Furthermore, it is interesting to note that during the first ten months of this year the chemical companies showed the following capacity changes:

Forming of new companies:	102	with a capital of L.	22,616,000
Companies with increased capital.	107	" " " " "	407,978,000
Liquidated companies:	54	" " " " "	33,560,000
Decrease in capital:	39	" " " " "	56,718,000
Report as of Oct. 31:	877	" " " " "	2,977,602,000

In recent years the Italian chemical industry has reached a position of primary importance in the international industrial chemical field.

One of the most important developments of the nitric acid industry, through the successful discoveries of the two Italian geniuses of world-wide fame, Casale and Fauser, has made it possible for Italy to furnish the farmers of the country with all the nitric acid necessary for the preparation of

"Montecatini" factory at Ravenna, Italy producing superphosphate and mixed fertilizer



*Director "L' Industria Chemica"

ammonium nitrate and calcium nitrate, the two fertilizers that are taking the place of the Chilean nitrate. The "Montecatini" plants in Merano and Crotone can already produce 50,000 tons annually of nitrate of calcium at 15%. The manufacture of nitric acid has been considerably improved in Italy, through the adoption of high pressure methods of manufacture.

Synthetic Nitrogen Developments

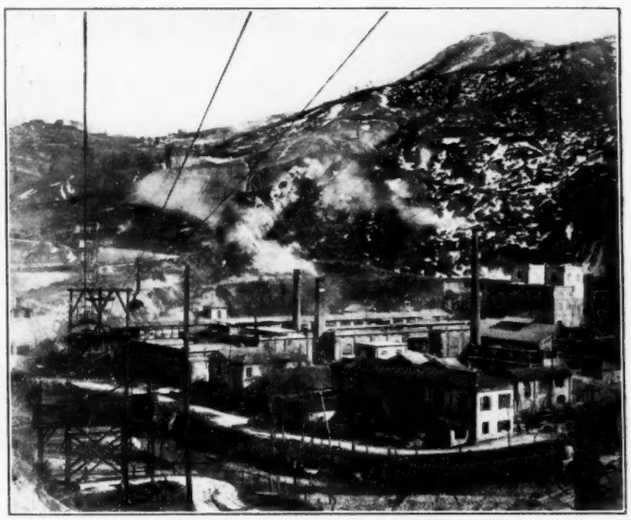
Immediately after the World War the nitrogen problem attracted the attention of the industrialists of the country. The first process for synthetic ammonia to be applied industrially was that of Dr. Casale, who started his production in 1920 at Terni in the Establishment of the Societa Italiana Ammoniaca Sintetica; and later in 1923 at Nera Montoro, with a total production of 12,000 tons of acid per annum. Some years later the Azogeno Company was established, which company uses the Calude process with a production approximately of 6,000 tons of acid per year. The Fauser process was used industrially for the first time at Novara in 1922, and has now a production of eighteen tons of ammonia daily. Following the favorable results obtained, the Fauser process was definitely adopted by the Montecatini company in the following establishments: Mas (daily production of ammoniac —3 tons)—Merano (75 tons), Crotone (60 tons).

To these must be added the plant of the Societa Sarda Ammonia in Oschiri, which produces ten tons daily. The production of the plants using the Fauser process in Italy now exceeds 30,000 tons annually. The Fauser process was also largely used abroad and is now used in Germany, Belgium, Holland, Japan, Poland and Canada.

Interior of the "Montecatini" plant showing vats for the crystallization of copper sulfate

The Soviet Government has finally decided to use the Fauser process in Russia: the factory will be constructed in Gorlofka, in the Donnez district, and will produce 80 tons of ammonia a day.

While Italy ranks third highest in the world in the production of phosphate fertilizers, her production of potassium fertilizers is quite small, but will soon show an important improvement with the solution of the problem of using Leucite.



Exterior view of the sulfur plant of the "Montecatini" located at Bellisio

This year plants for the treatment of Leucite were constructed, according to the plans of Prof. Gian Alberto Elanc, of the Roman University in Rome, and Italy is to become a large producer of potassium salts, as well as aluminum in its purest state.

In Aurelia, near Civitavecchia, there are being constructed large plants to obtain from Leucite a quantity of potassium exceeding by far the 250,000 tons per annum which Italy needs, whereas the production on a very large scale of aluminum of Italian origin, will fortunately make Italy among the principals, if not the first aluminum producing nation in the world.

Blanc Project

When the production program will have reached its highest development, it will give work to approximately six thousand men, divided between the mines and chemical plants.

The Blanc project, which was previously approved in the countries where patents are examined in advance (Germany, United States of America, etc.) shows the following new characteristics:

1. A method of applying a silicic acid, causing the immediate elimination of the silica, without calcination or filtering.
2. Complete separation of the potassium salt from the aluminum salt, with total elimination of iron from the latter salt.
3. The preparation of an oxide of aluminum, of a new type, with chemical characteristics not present in the common aluminum oxide.

The manufacture of fertilizers this year has required large quantities of sulfuric acid which Italy has been able to make with ease from its vast reserves of

pyrites. Excellent iron mineral is now extracted from the enormous mass of pyrite ashes accumulated in these plants; whereas in Marghera, it is concentrated and the pyrite ashes containing copper are worked through a convenient process, yielding approximately 3,000 tons of copper annually.

The demand for alkalies increased enormously, in a number of industries; however, over 85% of the total is used by the Solvay Establishments in Rosignano, near Leghorn, and the factory in Adria Monfalcone, which is now also controlled by the Solvay Co.

Minor quantities of caustic soda are obtained by the electrolytic process and in this connection it is to be noted that the quantity of energy used annually in the electro-chemical plants exceeds two milliard Kw., that is, 20% of the total energy consumed in Italy.

Italy now produces the largest part of the intermediates used for the preparation of acid dyes, sulfur pyrazolonyes, etc. the nitrates extracted from benzol and phenyl, aniline, the derivatives of naphthaline, naphthonic acid, Cleve acid, Tobias acid, Brouner acid, Freund acid, Schaffer acid, S acid, H acid, metanaline acid, gamma and isogamma acid.

Library of the Istituto Nazionale Medico-Farmacologico at Serono, one of the largest research organizations in Italy

The remarkable progress made by Italy in this industrial field is represented by the comparison of the figure of imports, exports, production and consumption in 1914 and 1927:

Year	*Import*	*Export*	*Production*	*Consumption*
	Kg.	*Kg.*	*Kg.*	*Kg.*
1914	5,263,000	67,700	1,001,700	6,196,800
1927	1,461,000	281,500	6,160,000	7,339,500

Latest statistics from January 1st to July 31, 1930, give us the following import and export figures for synthetic colors:

Imports	Quintals	9,262	Lire 40,098,283
Exports	"	4,803	8,554,180

Pharmaceutical Developments

The pharmaceutical industry employing more than eight thousand men has now reached a production of 350,000,000 Lire. There are some Italian firms, i. e. Carlo Erba, Zambelletti, Istituto Nazionale Medico-Farmacologico Serono, Istituto Sieroterapico Milanese, Schiapparelli, and many others who have reached very high figures in production and exportation. In Salsomaggiore a plant has been placed in operation with perfect efficiency, with a daily production of iodine of 100/200 Kg. In Margherita di Savoia, the Societa Italiana del Bromo constructed a plant of Kubierschky towers to extract bromine from the lye water of that salt, and they expect to furnish Italy with all the bromide required by the country, at the same time producing bromides of sodium, of potassium and ammonia.

Alcohol Production

The production of ethyl alcohol is operated chiefly by eight firms all owning first class distilleries, employing approximately 1,000 men.

First of these is the Soc. An. Distillerie Italiane, of Milan, with a capital of Lit. 130,000,000 and in view of the extensive project to which they have dedicated themselves, they have become a great authority in this connection.

The Italian Distilleries own almost all of the stock capital of the Societa Saccarifera Lombarda; they control the four sugar refineries in Molinella, Bondeno, Polesella, Casalmaggiore, and the affiliation of Jolanda di Savoia, which altogether consume 7,500 HP of power and produce more than 425,000 quintals of sugar.

They own 14 establishments, and this year they are expected to produce approximately

200,000 edri* of alcohol
40,000 quintals* of potassium saline
10,000 quintals of compressed carbonic acid
12,000 quintals of bicarbonate of soda

Furthermore they produce approximately 70% of the Italian yeast requirements.

7,500 edri of alcohol
6,000 quintals of raw tartar
25,000 quintals of grape-pips
2,500 quintals of oil

It is also interesting to note the contribution of the Italian Distilleries to the raw materials necessary for the manufacture of nitrocellulose varnish.

*A quintal is roughly equivalent to a hundredweight; an edri is equivalent to 26.5 gallons

At present the Italian Distilleries is producing acetone, methyl acetate, ethyl acetate, butyl acetate, amyl acetate, butyl alcohol, isobutyl alcohol, amyl alcohol.

In 1928 the Italian Distilleries took over almost all of the shares of the "Appula", Societa per l'Industria Chimica Italiana, for the purpose of increasing the good relations already existing and to control directly one of the most important companies for the manufacture of tartar products. The Appula Co. is without doubt the greatest producer of tartaric acid in the world, with a yearly production of approxmately 50,000 quintals; in addition to the tartaric acid and cream of tartar, this company manufactures the following: tartar emetic, tartrates, quinone, hydroquinone, chrome alum, heramethyltetramine, exametylentetramina, magnesium carbonate and lime, sulfuric acid, muriatic acid, magnesium oxide, sulfites and bisulfites, sulfates of magnesium, potassium sodium and zinc, calcium stearate and aluminum and zinc stearates, discoloring and absorbing vegetable carbon ("Decolorante Appula"), zinc oxide, zinc chloride, etc.

Some time ago the Societa Anonima "L'Appula" started the manufacture of all the series of hydrosulfites, cleverly solving the very difficult technical problem of obtaining perfectly pure products.

Barium Salts

Mention should be made of another prominent Italian industry, the Fabbrica di Sali di Bario di Calolziocorto, near Milan.

The plant in Calolziocorto takes barytine (natural barium sulfate) from their own mine in Valsassina in quantities exceeding 50,000 quintals per annum, and by successive processes using acids produced in the plant itself, prepares all the salts derived therefrom, especially the manufacture of C. P. barium sulfate pulverized and in gelatine form.

In these same plants the blue mineral of Sicily is worked for the preparation of strontium salts, and sodium sulfate is produced for the production of anhydrous sodium phosphate.

Wood Distillation Depressed

The wood distillation industry and its by-products now feel the effects of the world-wide crisis and have not always been able to operate at capacity; however, the manufacture of the products by the (acetic acid, etc.) synthetic process has been well developed.

The "Societa Acetati e Derivati", of Turin, which has equipped its plants with modern equipment, owns four factories: Bagnasco, Maccagno, Santa Maria del Taro—of the four above mentioned factories, two are properly equipped for the distillation of wood and for the production of calcium acetate, methyl alcohol and charcoal, and of course, wood tars. These plants are able to treat up to a total amount of 50 tons of wood per day, with the relative quantity of calcium acetate, methyl alcohol, charcoal and tar.

The plants in Bagnasco and Novara are equipped for the manufacture of calcium acetate for the production of acetic acid of different qualities, for the production of acetone and acetone oil and of various acetates. This plant can produce up to 50 tons monthly of acetone; the one in Novara can produce up to 100 tons monthly of acetic acid calculated as monohydrate.

There is a large and modern plant for the preparation of acetic acid synthetically, the plant of the "Societa Italiana Prodotti Sintetici" in Villadossola. This plant is able to produce over 250 tons monthly of acetic acid, calculated as monohydrate.

The "S. A. Industrie Chimiche & Forestali" has constructed and operated, since 1925, the first Italian formaldehyde factory, using methyl alcohol. This industry can be considered as an offshoot of that of wood distillation. The establishment is in Maccagno (on Lago Maggiore). This factory can produce five-sixths of a ton a day, much more than the Italian consumption.

Coal Tar Industry

Approximately 60,000 tons of tar were distilled in 1930. The products obtained were the following: benzol, toluol and xylol, light and heavy oils, refined and washed for various uses; naphthaline, black varnish; pitch in various qualities; liquid tar prepared and purified; road-tar for the construction and maintenance of roads; carbolic acid and cresylic acid in various qualities; carbolinium; disinfectants with elements of oil of tar.

In 1930 benzol underwent a further development because there was a decided increase in the quantities of raw benzol extracted from the refining of gas, both in the gas works and coke factories.

The preparation of the road-tar for roads also showed an increase as the Italian coal-tar plants seriously worked on the preparation of a specially adaptable grade of material for this purpose.

In 1930, the preparation of black color especially applicable to the rubber industry was also undertaken. The national rubber industry will soon become independent of foreign production of black dye.

The tar distillation industry was able to produce, in 1930 more regularly than in the past, because of the fact that the tar oil not applicable for other technical uses was used on the preservation of lumber, the use of chloride of zinc has been abandoned in Italy. Furthermore, as was the case abroad the Italian factories of activated carbon, have again begun to operate, as a result of the low price of pitch and tar.

The Soap Industry is Active

The soap and stearine industry operated during 1930 at a high rate of activity giving work to approximately 6,500 men. The leading firm in this

industry is the Saponeria Lo Faro & Co., which, in the establishment in Bolzaneto, covering an area of 100,000 mq., is furnished with the most modern machinery and complete equipment for the production of glycerine. This year it produced up to 250,000 quintals of soap.

A Purely Italian Industry

Finally it is necessary to speak of a purely Italian Industry, and that is, the industry of boric acid.

The Societa Boracifera in Larderello, established in 1912 following the merger of the various concerns operating the borax industry, owns eight factories situated in the zone surrounding the Cornia and Cecina rivers, in the Province of Pisa.

The activity of the plant includes two branches, that is, the chemical and electric branches, both based on the utilization of steam, of volcanic origin (the so-called "soffioni", steam spouts) which arise naturally out of the earth but which, in much larger quantities and better conditions of exploitation, are obtained from openings in the ground reaching a variable depth of more than 500 meters.

The volcanic vapor brings out the boric acid, ammonia and other substances and is mixed with carbon dioxide gas. From some openings in the earth is obtained the boric acid water, which is also taken from underground by simple means of removal of deposits, operated by the natural vapors.

The boric acid water is then concentrated by evaporation, and cooled, which (according to the extent of crystallization) varies from 97 to 98% to a minimum of 82%. The acid is then dried and shipped as raw, or refined and used for the manufacture of borax (adding carbonate of soda).

The ammonia contained in the vapor is placed, in convenient equipment, with sulfuric acid, obtaining ammonium sulfate which is purified and sold as talc, or decomposed in retorts with lime to use the ammonia in special chambers to produce, together with carbonic acid, the ammonium carbonate.

The carbonic acid, which is found in great quantities in the natural vapor, is used. It passes into a special section where it is dried and purified. It enters into the preparation of the ammonium carbonate but, chiefly, it is liquified and sold in bottles.

Other products of the Boracifera factory are sodium perborate and all the special salts which may be required.

The production of the Boracifera plants in 1929 and for 1930 (estimated) is as follows:

		1929		*1930*
Boric acid, commercial	Kg.	576,000	Kg.	590,000
Broic acid, refined		990,000		1,100,000
Borax		3,200,000		3,100,000
Ammonium carbonate		270,000		275,000
Sodium perborate		20,000		30,000
Carbonic acid		160,000		195,000
Various products		110,000		120,000

For exportation there is as follows:

		1929		*1930*
Boric acid, commercial	Kg.	340,000	Kg.	345,000
Boric acid, refined		534,000		828,000
Borax		887,000		1,590,000
Ammonium carbonate		93,000		95,000

Sugar Restriction Accord

Paris—With a tentative agreement on the question of quotas reached between Thomas L. Chadbourne and the principal sugar producing countries of the world, there only remains the formal drawing up of the cartel agreement and its signature, unless Poland and Czechoslovakia refuse to accept the new modification of their quotas. This is not thought likely to produce new stumbling blocks.

The basis on which agreement was reached gives the Germans an export quota of 500,000 tons for the fiscal year 1930-1931, the first year of the Chadbourne plan, 350,000 the second year and 300,000 each for the remaining three. In other words, an export quota of 1,750,000 tons was given to Germany for the five years when she had asked for 1,850,000, and as against 1,000,000 foreseen in the original Chadbourne plan.

The extra 750,000 tons is to be made up by reducing the export quotas of the other beet sugar producing countries by 175,000 tons and slicing 575,000 tons from the Cuban quota in the course of the five years. The total amount of sugar to be exported remains the same.

The actual cartel agreement will revolve around the problem of stabilizing the sugar industry and readjusting production to demand. The enormous surplus now on hand, amounting to about 3,500,000 tons, will be segregated and sold over the period of five years, at the same time serving as a safety valve against an unwarranted rise in price, according to a statement issued by Mr. Chadbourne.

Tin Agreement

Paris,—A condition agreement was reached on January 22 in negotiations among Bolivia, the Federated Malay States, Holland and Nigeria concerning further reduction of production of tin in 1931 in an effort to sell existing stocks and prevent a further fall in prices.

The Malay States agreed conditionally to a reduction and representatives of the other countries were studying conditions.

The accord would reinforce the previous system of voluntary restriction. It would set retroactive international quotas from January 1, 1931, to December 21, 1932. The quotas—but not the ratio quotas—would be varied as conditions in the future may require. An advisory committee would be named to aid in fixing the various quotas. The agreement would embrace about 90 per cent. of the world output of tin and is expected to stabilize the situation and to bring production and consumption more nearly in accord.

Great Britain

London—The Society of Chemical Industry has awarded its medal for the year 1931 to Dr. Herbert Levinstein, whose successful year of office as President has been followed by the office of Chairman of Council in recognition of twenty years of devotion to the British dyestuff industry.

British makers announce the following prices for spot lots: Bichromate of potash, crystals, granular, 4½d per pound; ground, 4¾d; bichromate of soda, crystals, cake, powder, 3½d; anhydrous 4¼d. Contracts for 1931 with discounts according to quantity: Chromate of potash, 8½d per pound; chromate of soda, 3⅝d; bichromate of ammonia, 8⅛d; chromic acid, 1s per pound, less 2½ per cent; oxide of chromium, 9d, 9¼d and 9½d per pound, according to quantity.

France Satisfactorily Balances Chemical Production and Consumption

By Jean Debuigne*

DUE to the harmonious relationship existing between production and the possibilities of domestic consumption, the French chemical industry has not suffered any serious crisis during the year 1930 and has been able to maintain an activity fairly satisfactory in the midst of the economic storms which surge all over the entire world.

While it was possible, in general, to maintain output figures reasonably close to those of 1929, it may be stated that this was also true of the trend of prices. In fact, the prices of heavy chemicals, such as sulfuric acid, hydrogen chloride, carbonate of soda, sulfate of soda, caustic soda, chloride of lime, etc., have remained stable, with a slightly upward trend. On the other hand, as a result of the slump of world market quotations, potassium, phosphate and nitrogen fertilizers have suffered a decrease in prices; so has nitric acid, which dropped following the decline of nitrogen products.

Foreign Commerce

Speaking of foreign commerce, the situation may likewise be termed satisfactory, if one takes into account the difficulties of the present period. As a matter of fact, the results of 1930 compare well with those of 1929, and any differences noticeable are of minor extent. Incidentally, the official statistics covering the French foreign commerce and published by the General Customs Administration reflect this privileged position which both industry and commerce of France enjoy. Therefore, the statistics recently published, referring to the first nine months of the year of 1930, give a fair idea of the entire foreign commerce of France (including all industries). In the export and import figures given later, the figures are for industrial raw materials and manufactured goods.

The actual figures show that during the first nine months of the year 1930, the total values of imported products (raw materials and manufactured goods) have been 7% lower than those of an equal period in 1929, and that the total values of exported products have been 13% lower than those of 1929.

*Director, Revue des Produits Chimiques

If we now examine the results of foreign commerce with reference to chemical products proper, as well as to principal raw materials which serve to manufacture them, we realize that the changes from one year to another are even less important. It will be found, for instance, that imports and exports of actual chemical products show the following results during the first nine months of 1929 and 1930, respectively:

	Imports		*Exports*	
First 9 months of	*Value In 1000 Francs*	*Quantities in Metric Hundredweights*	*Value in 1000 Francs*	*Quantities in Metric Hundredweights*
1929.....	885,991	7,154,165	2,496,698	22,944,156
1930.....	863,544	8,359,924	2,401,957	22,870,466

Examination of these figures shows that:

The total value of imports has remained constant during the two years, but the total weight was higher in 1930, which corresponds to a lowering of prices of imported products. Secondly, the total value and total weight of exports have remained stable. This evidence confirms the opinion which we expressed at the beginning, that during the past year the activity of the French chemical industry remained reasonably close to that of 1929, and that the prices quoted were more or less stable.

As to the principal raw materials used in the chemical industry, the following figures are reported for the same period:

	Imports		*Exports*	
First 9 months of	*Value in 1000 Fr. Francs*	*Quantity in Metric Hundredweights*	*Value in 1000 Fr. Francs*	*Quantity in Metric Hundredweights*
1929.....	1,373,167	16,202,844	630,712	2,265,452
1930.....	975,079	13,193,205	509,409	1,738,175

In this instance, we find a decrease in both quantities and values during 1930, as compared to the 1929 figures. With reference to imports, this decrease amounts to a difference of 398,088,000 Fr. Francs and 3,009,639 metric hundredweights, chiefly due to the fact that the import figures for nitrate of soda were lower by 284,794,000 Fr. Francs and 2,278,506 metric hundredweights in 1930, compared to the same period in 1929.

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The reason for lacquer manufacturers using nitrocellulose solvents boiling above ethyl acetate is because the higher boiling solvents lend valuable characteristics to a lacquer which ethyl acetate cannot give. Amyl acetate is the most valuable of the acetates boiling above ethyl acetate. Don't be fooled by "so-called Amyl Acetates."

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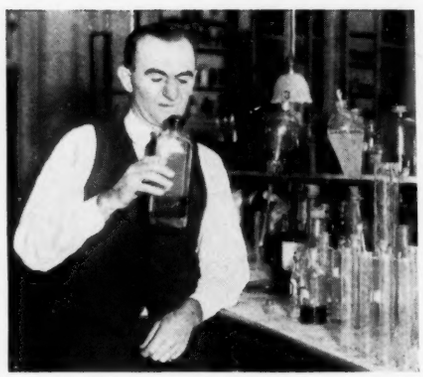
CHEMICAL

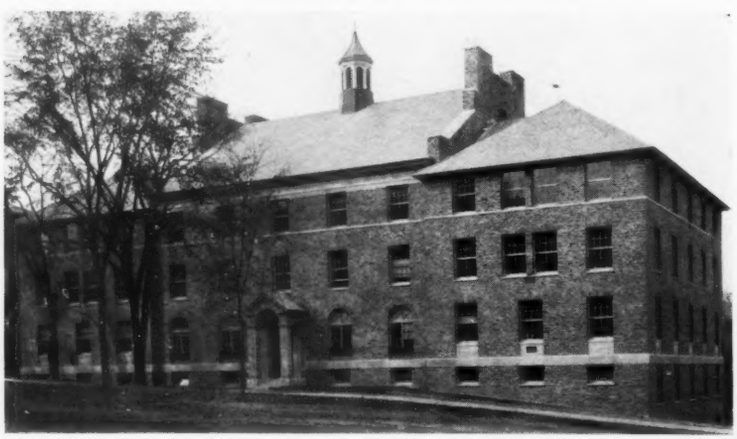
Photographic Record

Sir Harvey McGowan who succeeds the late Lord Melchett as head of the Imperial Chemical Industries, Ltd. of England



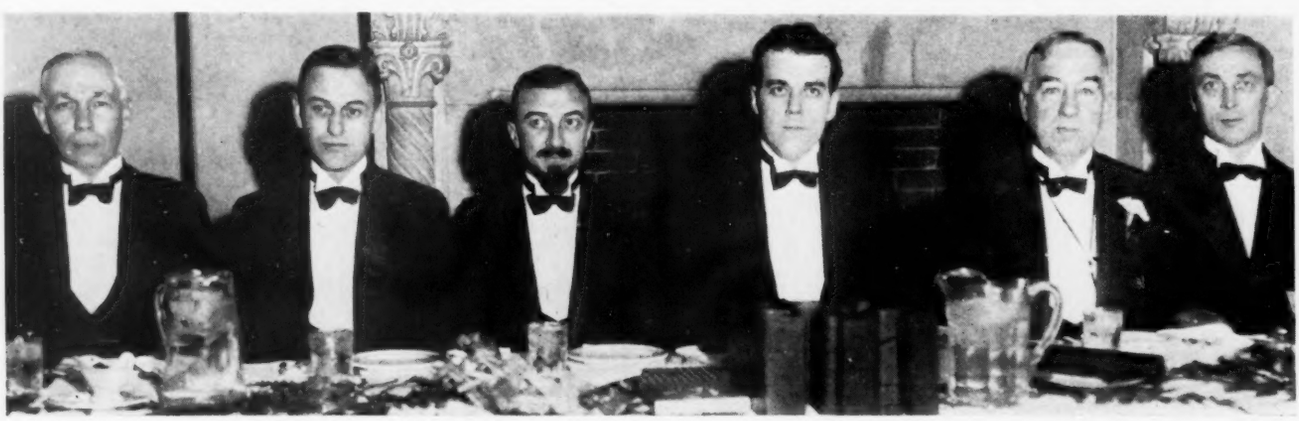
G. F. Beyer, Chief Chemist of the Bureau of Industrial Chemistry, wrinkles his nose when he smells Alcotate, the new alcohol denaturant

Below, McGregory Hall of Chemistry, Colgate University, recently dedicated. Delegates from thirty-four colleges, universities and scientific societies attended the two day exercises



Scientists and engineers attend New York dinner of Worcester Poly Alumni. Left to right—Dr. Samuel S. Edmands, Pratt Institute; Dr. H. Horton Sheldon, Science Editor, New York Herald-Tribune; Prof. Johnson O'Connor, Consulting Psychologist, General Electric; Leon V. Quigley, Technical Editor, Bakelite Corp., and President, New York Association of Worcester Tech. Alumni; Admiral Ralph Earle, war-time Chief, Bureau of Ordnance; Dr. John Johnston, Director of Research, United States Steel Co.

An award for distinguished achievement in chemistry: Dr. Arthur D. Little receives the Perkin Medal from Dr. Daniel D. Jackson of Columbia University in Havemeyer Hall at Columbia



NEWS REEL
of Chemical Activities

Chemists' Club (New York) is reopened after completion of extensive changes. Main dining room (below). This area was formerly the Club lounge. Now it forms the chief unit in a floor devoted exclusively to dining rooms. In the background may be seen a splendid portrait of E. R. Squibb

Detail of the main staircase. The bronze bust of Morris Loeb, artistically located in a niche at the turn of the stairway, pays tribute to one whose foresight and generosity did much to guarantee the present social home of American chemists

Right, an atmosphere of restfulness and charm pervades the new Club lounge. Where once was the stage of Rumford Hall is now a stately fireplace

Left, another view of the lounge, showing the mezzanine writing room. The former balcony has been converted for the pleasant purposes of those who write above or beyond the maddening throng. Decorative treatment of the columns and pilasters is worthy of note

Phenol

THE high quality of Monsanto Phenol U.S.P. has been "built in" by years of large scale manufacturing experience. Buyers recognize its superiority for use in synthetic resins, molded plastics and many other applications. Always pure and uniform, Monsanto Phenol can be depended upon to give complete satisfaction.

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Fabriques de Produits Chimique of Thann, important French producers of titanium white

In the case of exports, the difference in values and quantities compared to 1929 figures, is: 121,203,000 Fr. Francs and 527,277 metric hundredweights, which is chiefly due to a drop in exports of the following raw materials: Oils (other than olive), Sulfur and Pyrites, Mineral Tar, and which is caused by a difference (for the total of the three respective numbers of the Customs Tariff) of 87,314,000 Fr. Francs and 432,463 metric hundredweights. These declines in the exports of raw materials are apparently due to the dullness in business transactions the world over.

In concluding this chapter, we reproduce in the following an abstract of official statistics published by the General Customs Administration. This gives a general conception of the importance of the French foreign commerce with reference to the principal classifications of manufactured chemical products, as well as of raw materials; it covers the period from January 1st to September 30th, 1930, which we discussed in this paper.

French Pigment Industry

The French domestic consumption of lithopone which was around 10,000 metric tons in 1913, has increased considerably since then and is at present estimated at 18,000 tons a year. This quantity is furnished by the output of six factories which are in a position to fill all of the requirements of the country and to export their surplus production, whereas up to 1926 France imported rather extensive quantities. as will be seen from the following table:

12,000	metric	tons	were	imported	in	1924
7,600	"	"	"	"	"	1926
2,700	"	"	"	"	"	1927
350	"	"	"	"	"	1928
190	"	"	"	"	"	1929

Six factories take care of the production of lithopone namely:

At Bouchain (Nord), the factory of the Societe des Couleurs Zinciques;

At Comines (Nord), the factory of the Societe des Produits Chimiques et Blancs de Comines;

At Estree-Blanche (Pas-de-Calais), the Societe des Produits Chimiques d'Estree-Blanche;

At Dieuze (Moselle), the factory of the Societe Industrielle des Produits Barytiques, branch of the Societe Kuhlmann;

At Ham (Somme), Messrs. Lefrant, Dargaud & Cie.;

At Lyons (Rhone), the old Etablissements Gauthie-Miribel (at present being reorganized).

The manufacture of red oxide of lead and of other oxides derived from metallic lead, reduced to a high degree of dispersion by electrolysis, has been undertaken in the Basses-Pyrenees (in the South of France).

Metallic Oxides

The Fabriques de Produits Chimiques of Thann and Mulhouse who started the manufacture of titanium white in France in 1923, use the processes of the Societe Francaise de Produits Chimiques des Terres Rares. These people manufacture an oxide of titanium which is commercially pure (under the trade name of "Thann White"), the usage of which is constantly gaining importance. This calls to mind that the processes of the Societe Francaise des Produits Chimiques des Terres Rares are exploited in foreign countries by the following concerns:

The Commerical Pigment Corporation, Baltimore U. S. A.

The Societa Anonima Titanium, Bovisa-Milano, Italy.

The United Manufacturers of Chemical and Metallurgical Products, Aussig, Czechoslovakia.

The Participation of Coal Mines in the Chemical Industry

A peculiarity of the French Chemical Industry which will be discussed in the following paragraphs is the fact that the large mining companies are taking up, more and more, the manufacture of chemical products. A characteristic development takes place in these enterprises; it is partly based on the more rational utilization of the chemical properties of pit coal and its derivatives, but also, on the other hand, on a necessity to economize. This is being done by reducing the cost price, in order to meet the keen competition which French coal mines must stand on the domestic markets from foreign producers who dispose of strata offering larger facilities for exploitation.

For this reason, the French coal mines have been compelled to take up a new industry,—the larger chemical industry—demanding large amounts of capital which must be redeemed within a short period of time. Further exigencies are: a trained staff and some material which they paid no attention to heretofore. Having decided to follow this direction, the coal mines achieve an inevitable program which brings them in touch with a large variety of products, be they intermediates or finished products; their number increases from day to day and classes them at present among the principal French chemical enterprises. A typical fact illustrating this development is the following: As a result of the manufacture of a new fertilizer, the "potazote", taken up by the Compagnie des Mines d'Aniche, the latter concern has become a producer of large quantities of carbonate of soda which is a by-product of this manufacturing process. In pursuing to the extreme limit the problem of utmost utilization of coke, the same company is at present engaged in organizing the industrial manufacture of "carbonalpha", chemically pure carbon, obtained by a catalysis of the carbon oxide which is found in an extremely divided state. Besides being used to advantage in the rubber industry in the form of carbon black, this carbon product is to be utilized for internal combustion motors, instead and in the place of liquid hydrocarbons derived from pit coal or petroleum. By these consecutive transformations: Pit coal ➡ coke ➡ carbon oxide ➡ carbon-alpha one will finally arrive at the utilization of pit coal for internal combustion motors.

Fertilizers

The recent Nitrogen Conference has not prevented the upward trend of the French production of nitrogen which, by the way, only represented a small unit compared to the leading members of the conference.

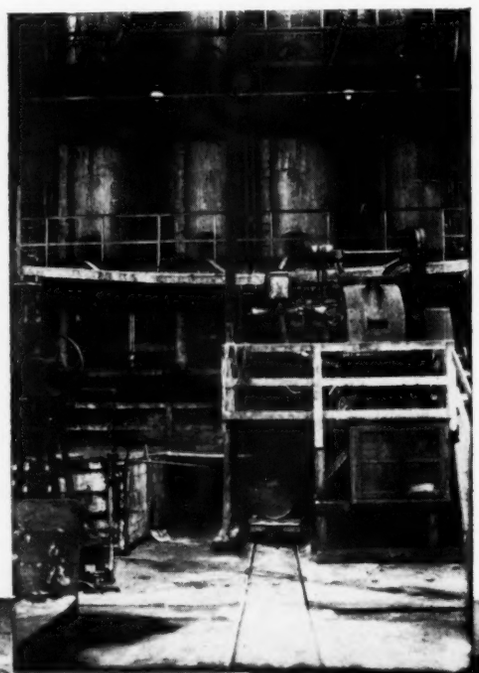
Similar to other branches of its chemical industry, France has built plants for the manufacture of synthetic nitrogen products only to such an extent as the domestic consumption warranted. With reference to synthetic ammonia, the following three processes are being exploited in France:

the Claude Process,
the Casale Process,
the N. E. C. Process (Nitrogen Engineering Corp.)

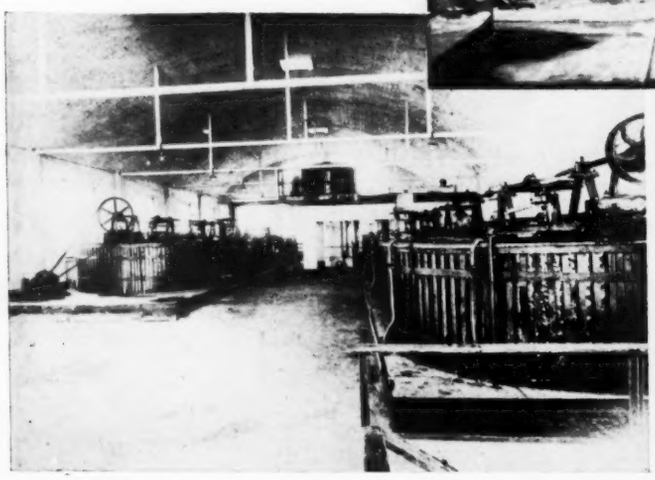
Here again, the pit coal mines are at the head of production, utilizing the hydrogen contained in the gases of the coke-ovens which show the following average composition:

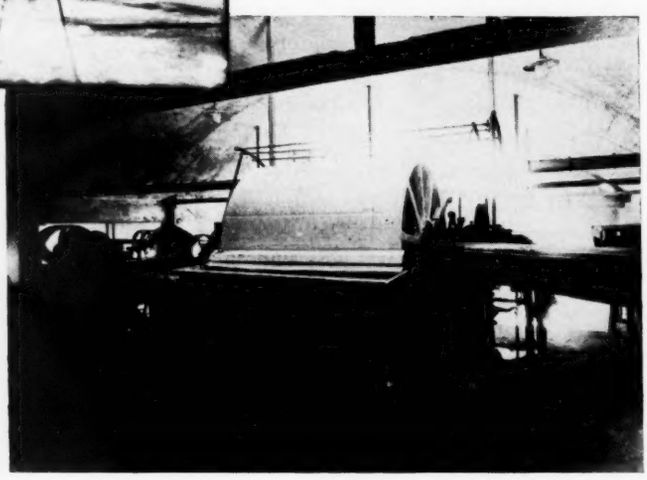
Hydrogen	50%	in vol.
Methane	25%	" "
Ethylene	2%	" "
Carbon Oxide	8%	" "
Miscellaneous	15%	" "

We are giving in the following the names of the concerns exploiting the various processes, grouped accordingly, and showing their respective production capacity:



Interior views of the Fabriques de Produits Chimique. Left, crystallizing out copperas as an impurity. Below, clarifying tanks employed in the manufacture of titanium oxide





The French method of producing titanium pigments is now employed in many parts of the world. Below, a rather unusual type of rotary filter press

Foreign Commerce of France in 1930

Class of Merchandise	Imports: Weights in Metric Tons for the first 9 months of 1930	Imports: Weights in Metric Tons for the first 9 months of 1929	Imports: Values in Thousand French Francs for the first nine months of 1930	Imports: Values in Thousand French Francs for the first nine months of 1929	Exports: Weights in Metric Tons for the first 9 months of 1930	Exports: Weights in Metric Tons for the first 9 months of 1929	Exports: Values in Thousand French Francs for the first 9 months of 1930	Exports: Values in Thousand French Francs for the first 9 months of 1929
Industrial Raw Materials	39,594,610	37,348,228	22,659,979	26,515,738	22,482,059	24,771,251	7,671,868	9,480,992
Manufactured Goods	1,746,976	1,486,550	8,507,702	7,272,042	3,703,094	4,000,569	20,527,739	23,141,907
	41,341,586	38,834,778	31,167,681	33,787,780	26,185,153	28,771,820	28,199,607	32,622,899

Claude Process:

Mines de Bethune	60	tons (metric) per day
Mines d'Aniche (Societe l'Ammoniaque Synthetique)	60	" " " " "
Societe Houilliere de Lievin (L'Ammoniaque de Lievin)	25	" " " " "
Societe de Commentry, Fourchambault et Decazeville	5	" " " " "
Hauts-Fourneauz de Rouen		being erected
Houillieres de Saint-Etienne	5	" (metric) per day
	155	

Casale Process:

Societe des Mines de Dourges	15	metric tons per day
Compagnie des Mines de Vicoignes, Noeux et Drocourt	7.50	" " " "
Societe de Produits Chimiques Anzin-Kuhlmann	18	" " " "
Sarre et Moselle	16	" " " "
Marles Kuhlmann	25	" " " "
Mines de Lens	20	" " " "
Les Produits Chimiques de Roche-la-Moliere	24	" " " "
Les Phosphates Tunisiens	45	" " " "
Office National de l'Azote	153	" " " "
	323.5	

Nitrogen Engineering Corporation Process

Etablissements Kuhlmann (Usine de La Madeleine)	50	tons (metric) per day
Courrieres Kuhlmann	25	" " " "

Of all these factories, only the Phosphates Tunisiens (factories at Soulom) produce their hydrogen by using electrolysis; all other systems are based on the gases of coke-ovens or on watergas.

Synthetic Products

As previously stated, the gases of coke-ovens in the French pit iron mines have an average carbon oxide content of 8%. This gas is actually utilized for the synthetic production of methanol. During the years of 1929-1930, the Compagnie des Mines de Bethune has manufactured 1131 metric tons of methanol and 598 tons of formol.

The Compagnie des Mines de Courrieres has an annual production capacity of 3,600 tons of methanol. In this factory, the carbon monoxide and the hydrogen utilized in the synthetic products are obtained direct by cracking methane (still derived from the gases of the coke-ovens) with 1100° C. steam. Incidentally, we may mention that the Compagnie des Mines de Bethune utilizes its methane in burning it in a current of air; besides the important releasing of recovered calories, this system furnishes nitrogen and thus covers all the requirements of an ammonia plant. Finally, the Compagnie des Mines de Lens has under construction a factory for the production of methanol.

Synthetic Alcohol Production

Ethylene, also being among the items found in coke-oven gases, is used by the Compagnie des Mines de Bethune for the production of ethyl alcohol. In 1929-1930 this latter company produced 1284 metric tons of ethyl alcohol and 24 tons of sulfuric ether. The Compagnie des Mines de Marles is interested likewise in this question and is erecting a factory for the manufacture of ethyl alcohol.

As stated in the beginning of this article, one can observe from year to year a steady growth in the participation of the coal mines in the vast chemical industry and this movement is one of major importance in France to-day.

Foreign

Foreign chemical news of the month consisted chiefly of items reporting further negotiations for the curtailment of production of a number of the raw commodities. After several months of untiring effort Thomas L. Chadbourne succeeded in his plan for radical reductions in sugar cane acreages throughout the world and the final acceptances of his proposals are scheduled to be ratified at a meeting to be held at Cannes the first week in March. Tin producing countries concluded at the end of the month a tentative agreement on production quotas for 1931 which is hoped will tend to further stabilize the present condition of the metal market. As was fully expected Sir Harry McGowan was elected chairman and managing director of the Imperial Chemical Industries (I. C. I.) to succeed the late Lord Melchett. The Marquis of Reading in turn assumes the presidency left vacant by McGowan.

Sir Harry McGowan, K. B. E., is well known in this country, which he visits frequently in connection with the interests of the Imperial Chemical Industries. He is a director of the General Motors Corporation, the Finance Co. of Great Britain & America, International Nickel of Canada, and several large banking institutions. He was born in Glasgow, June, 1874.

MARS---

The Chemical Industrialist

By Williams Haynes

MODERN chemical commerce deals regularly in some three thousand different items—raw materials and compounds—and not a single one of all these chemical products escaped the influence of the World War.

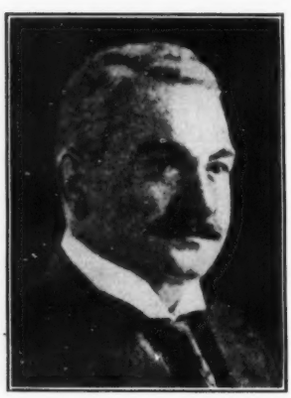
The source and quantity of every chemical supply; the character and intensity of demand for all sorts of chemicals were radically changed. Responding to these powerful economic forces every chemical price fluctuated widely while the industry made frantic efforts to establish a new equilibrium. The war conjured up an unbelievable chemical production. It inspired chemical research with a new vitality. It laid bare the chemical foundations of modern industry, and revealed to our chemical leaders a vision of operations upon an entirely new scale.

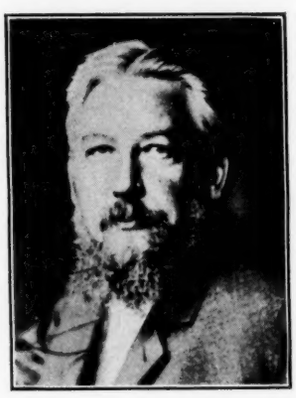
For modern warfare is waged not by men alone, but with every resource of the belligerents. The World War taught this lesson thoroughly. Even the man on the street now appreciates that modern battles are won as much by the factory hand and the farmer as by the soldier at the front. Statesmen, generals, and industrialists now understand clearly the broader economic implications of these facts, one of the most significant of which is the key position occupied, alike in modern industrialism and in modern warfare, by chemical materials and chemical processes.

Outside of Germany prior to 1914, military men were blind to this vital importance of chemistry while even chemical industrial leaders were blissfully ignorant of the pivotal position held by their products. Even in Germany, chemical values, in spite of the attention and publicity they had received, were distinctly underestimated. Through the haze of mystery that clouds German chemical operations during the war period, it is plainly evident that the munitions requirements for nitric acid were placed too low; that the imperative need for acetone was overlooked; and that the whole development of gas warfare was quite unforeseen.

The intense chemical activity inspired by the war throughout the world, while unprecedented in scope, was not a new phenomenon. Mars, the destroyer, has often been the stimulator of important chemical progress. As Alan A. Claflin has pointed out:

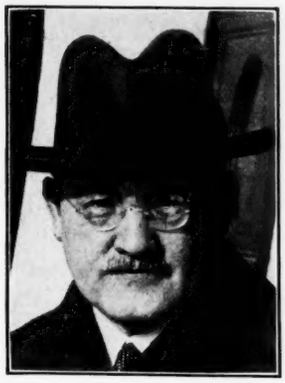
"The LeBlanc soda process was a French chemist's answer to the British blockade. It is strange, but nevertheless true, that the foundation of Britain's great alkali trade is found in this ingenious French reply to the famous Orders in Council of the Napoleonic wars. What the French invented in war, the British took in peace; and while the LeBlanc process is now obsolete, its influence upon the chemical industry must not be forgotten. Sulfuric acid was first made in quantity to satisfy the needs of the





Samuel Eyde (left) was the engineer who with Birkeland, the chemist, brought the arc process for nitrogen fixation into successful commercial operation in Norway

Wilhelm Ostwald (right) perfected the process for the commercial conversion of ammonia by oxidation into nitric acid



Carl Bosch (left), now head of the I. G., with Fritz Haber (right) developed the synthetic ammonia process for nitrogen fixation, which was first commercialized by the Badische Company

LeBlanc alkali industry. Hydrochloric acid, the escaping nuisance of the LeBlanc process, was condensed into commercial muriatic acid only on the insistence of the alkali inspector. The necessity for using this muriatic acid fathered the whole of the chlorine industry. Producer gas in its inception owes more to the alkali process than to the blast furnace. If manganese in the Welden process may be considered only the "slow movie" of the modern catalyst, surely, the chance process of sulfur recovery, that gave the LeBlanc process ten years of additional life, was the pioneer of modern catalytic operations. Thus it may be seen how the invention of the French chemist in the stress of war time had a peace-time influence that a century and a quarter has not dissipated."

The World War and Chemicals

Vastly greater chemical results have sprung from the greater struggle. It called forth new explosives. It introduced gas warfare. Its telephones, motor trucks, and air planes—to mention but three of its modern accessories—required new chemical materials. The coercion of its enormous, immediate demands for all sorts of munitions created critical problems of chemical manufacture that scrapped old processes and built new industries.

So great and so many were the chemical results achieved that a bare chronicle of the industry's war record would be an historical work of many stout volumes. So complex and so far-flung have been the after effects of that mighty effort that even the briefest economic appraisal would carry us far beyond the bounds of this article. Nevertheless, a just appreciation of the profound changes wrought by the war is necessary to a conception of the modern chemical industry.

We can best understand this vast, complicated revolution if we confine our attention to but three important, typical chemicals; nitric acid, phenol and acetone. These three belong to distinct chemical groups. They are vital in the manufacture of three of modern warfare's most necessary munitions: high explosives, poison gases, and air plane dopes. The processes of their production, during the war, underwent fundamental technical changes. Moreover, each of the three has played a major role in post-war chemical developemnts. Therefore, by reviewing their war-time production and their post-war adaptations to new uses, we can most plainly see the whole picture unobscured by confusing details.

A distinguishing chemical characteristic shared by explosives and fertilizers, is that they always contain the element nitrogen. The form of nitrogen, however, differs in compounds of the two groups. For plant food either nitrates or ammoniates are available. For explosives a variety of organic and inorganic compounds, not so readily and simply classified, are used; but the starting point in the manufacture of all these explosive compounds is nitric acid.

At the outbreak of the war the universal commercial source of nitric acid was sodium nitrate, treated with sulfuric acid to yield nitric acid and salt cake (Na_2SO_4); and the world's chief supply of nitrates—for fertilizers as well as the starting point in the manufacture of the acid—was drawn from the natural deposits of sodium nitrate found only in Chile. These rich beds, which had been discovered in 1809 by a vagabond explorer guided by Indians across the barren, rainless, plateaux of the Andes, had been first exploited as a result of the demand for nitrates created by the Napoleonic wars. The highly profitable monopoly skillfully fostered in this unique natural supply was destroyed—it seems almost poetic justice—by the nitrate demands of the World War.

Decline of Natural Nitrates

In 1913 Chile supplied 429,897 tons (in terms of N) or something better than 60 per cent of the world's consuming demand. In 1918, at the end of the war, she furnished 496,112 tons, a slighter greater quantity; but despite this, only a third of the world's total output. The decade following the close of the war saw the gross tonnage of Chile nitrates actually shrink, while their proportion of the world's production dropped to a fifth of the total. Behind these statistics of tonnage and percentage lies the most

sensational chemical development of the war period. Not only had the synthetic ammonia industry broken one of the world's great natural monopolies and by tapping the air's inexhaustible supply of nitrogen insured the human race forever against the possibility of starvation through lack of nitrogen plant food; but it had also brought into commercial operation an entirely new type of industrial process based on the chemistry of gases reacting together at high temperatures and under high pressures.

Pioneering in Nitrogen Fixation

In 1898 Sir William Crooke's gloomy prophecy of starvation had dramatized the problem of nitrogen fixation. In 1902 while Bradley and Lovejoy were experimenting with their pioneer fixation process in the Atmospheric Products Co. Plant at Niagara Falls, Birkeland, the chemist, and Eyde, the engineer, brought their arc process into successful commercial operation in Norway. The initial plant at Hotodden generated 3,000 horse power. Thanks to extremely cheap electrical power, this was so successful that in 1911 it was expanded to develop 60,000 horse power while a still greater operation (150,000 H. P.) was begun at Rjukan. The products were calcium nitrate (used directly as a fertilizer) and sodium nitrate; but even with improvements and refinements in the arc process, the determining economic factor has remained the cost of electrical power, a basic requirement that has irrevocably restricted the commercial expansion of this method of fixation.

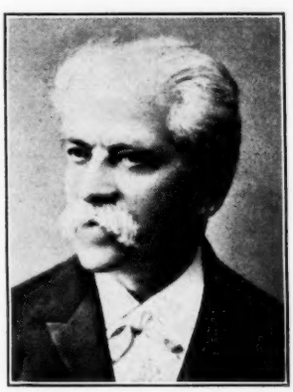
Prior to this, in seeking a process for the manufacture of cyanides (which had come into great demand for ore treatment) two German chemists, Caro and Frank, accomplished the commercial absorption of nitrogen in carbide to form calcium cyanamid ($CaCN_2$). Taking advantage of the comparatively cheap calcium carbide, resulting from the recent perfection of the electric furnace, an industrial-scale operation of the cyanamid process at Magdeburg, Germany (1905) was followed by a more commercially successful plant in Italy. Although power cost was still paramount, the cyanamid process required but a fourth of the electrical demands of the arc process, and this opened a wider field for operations. By 1913, thirteen plants, with a total output of over a quarter of a million tons of cyanamid, were operating. These were well scattered over Europe. There was moreover one plant operating in Japan, and since 1909 the American Cyanamid Company has been in production on the Canadian side of Niagara Falls.

The high power costs of both these processes and the character of their products, which require further chemical treatment to bring them to the market in the form either of nitrates or of nitric acid, furnished plenty of incentive for the invention of a cheaper, less round-about method of fixing air nitrogen. This was accomplished by the direct combination of nitrogen and hydrogen to form ammonia. This reaction, which had been known in the laboratory for many years, was made commercially possible by the researches of Fritz Haber, who discovered that the combination could be effected economically by bringing the gases together at temperature of 900° C, under a pressure of 3,000 lbs. to the square inch, in the presence of certain catalysts. The Badische Company undertook to commercialize this research. The task required the perfection of new alloys capable of withstanding this temperature and pressure as well as the design and construction of apparatus for the handling of this then-new type of exacting gas reactions.

Ostwald's Nitric Acid Process

Dovetailing with this synthetic ammonia process was a process perfected by Wilhelm Ostwald, for the commercial conversion of ammonia oxidation into nitric acid. Both discoveries were necessary to break the Chile nitrate monopoly. Ammonia, it is true, is available for plant food, but its exclusive, continued use results in a condition of soil acidity that eventually becomes prejudicial to plant growth. Nitric acid is, therefore, the proper starting point in the manufacture both of explosives and of fertilizers.

Armed with these two processes Germany felt secure in her chemical independence of natural nitrate from Chile. She dared to risk a blockade. Although there were years of sabre rattling, she only engaged in a general European war after these two chemical processes had been put into successful, commercial operation. Nevertheless she still underestimated her



Adolph Frank (left) and Heinrich Caro (right) successfully fixed nitrogen as cyanamid while seeking cheap cyanide

nitrogen requirements. The theoretical calculations of these needs were based upon the General Staff's optimistic plan of a short and decisive campaign. The Haber plant had a capacity of 7,000 tons N per annum. Feverishly this was expanded and another greater plant built, for it soon became evident that by-product ammonia from coke ovens or gas works "poisoned" the Ostwald process. Nitric acid for explosives depended therefore upon the pure synthetic ammonia of the Haber fixation process. The whole story of Germany's chemical struggles during the early stages of the War has never been told; but at the time we had reason to believe that 300,000 tons of Chile nitrate of soda found in Antwerp after its capture in 1915 was all that bridged the gap till the Haber extensions were completed.

Value of Nitrogen Independence

The Allies, thanks to the British cruisers, were not seriously disturbed in their improvident reliance upon Chile nitrates until 1917. Then a new naval weapon, the submarine, began to demonstrate its ability to close the channels of ocean transport. Not till almost the close of the war did we learn what was in reality its very first chemical lesson: nitric acid is the primary munitions requirement, and the direct process of ammonia synthesis because of low power costs and the purity of the ammonia produced, is the only sound surety of nitrogen independence.

So well was this lesson driven home, however, that by 1928 synthetic ammonia plants were in operation in every country of any industrial importance. Ten years after the war a total output of over 975,000 tons (more than the total nitrogen production from all sources in 1913) was attained. Even more arresting was the increase in the proportion of synthetic ammonia to all other forms of nitrogen. In the twenty years from 1908 to 1928 this grew from 1 per cent to 60 per cent of the total.

The greatest part of this enormous expansion was in Germany. The war-time experience was capitalized and nitrogen products replaced coal-tar products as the base of operations for the Badische Company. This new foundation was laid down under the Interessen Gemeinschaft Farbenindustrie, despite its organization out of the various dye-making companies and its now rather misleading corporate title and popular designation as the "I. G. Dye Trust." Likewise, in England, one of the first acts of the Imperial Chemical Industries, Ltd., after the consolidation by Lord Melchett in 1927 of the old firms of Brunner, Mond & Company, British Dyes, the United Alkali Company, and the Nobel Industries, was to rush to completion the gigantic ammonia plant at Billingham and to form a fertilizer-selling subsidiary, Nitram, Ltd. In France too, the post-war chemcial combination, built up around the Establishments Kuhlmann, immediately expanded its synthetic ammonia production. In the smaller countries where a nitrogen fixation industry was quite ridiculous from the point of view of peace-time domestic requirements, plants were built and operated under a variety of different forms of government subsidy.

The inevitable result of this world-wide expansion was an over-production of nitrogen. The large producers in Germany and England met this logical, but distressing situation by strenuous efforts to extend the use of nitrogen on the farm. They introduced a variety of new high-test chemical fertilizers of general type of nitrophoska (ammonium nitrate, di-ammonium phosphate, and potassium chloride) leunasaltpetre (ammonium sulfate-nitrate) and the English nitro-chalk (ammonium nitrate and calcium carbonate). They underwrote elaborate educational campaigns carefully planned to popularize these concentrated plant foods and to open new markets for them as in the treatment of pasture land.

In America air nitrogen first developed after the war for the production neither of nitric acid nor of fertilizer materials: but directly in the form of anhydrous ammonia. For this material there was at the time an established market of some twenty-five million pounds, chiefly in refrigeration. This consumption was expanding rapidly in the household field. Hitherto the demand had been supplied by material recovered from the waste ammonia liquors of the coke and gas plants, sold in the main through the sales agency of the Barrett Company. By the autumn of 1926, however, the Allied Chemical and Dye plant at Syracuse was producing 7,500 tons of anhydrous ammonia; the Mathieson Alkali Works at Niagara Falls, 3,000; and Roessler & Hasslacher, also at Niagara, 900 tons. Although the pioneer synthetic ammonia plant of the Niagara Ammonia Company had shut down, nevertheless the Lazote operation of the Du Ponts in West Virginia (7,000 tons projected capacity) was just about to come into production, and the competitive situation was fast becoming acute. The opening of the contract-writing season of 1926 was signalized by a dramatic slash in price from thirty to fifteen cents a pound.

Broadened Uses for Ammonia

The immediate effect of this radical price reduction was to halve the gross sales of $7,500,000. The ultimate result was a notable extension of the consuming market, exemplifying again the economic effects accomplished through lower costs due to technical advance. The cheaper ammonia found new uses, especially for neutralizing acid phosphate in mixed fertilizers, and accordingly, a new balance between supply and demand was struck. Though the ammonia price dropped to a third of its former level, still the gross sales in dollars eventually showed a net gain.

During the first decade following the war, the development of the synthetic ammonia industry in America was, as we have seen, quite different than in Europe, and it was not until early in 1929, when the Hopewell plant of the Allied Chemical and Dye Company came first into production with synthetic sodium nitrate, that the ammonia process was employed for the direct manufacture of fertilizer. Outside factors—chemical, agricultural, and political—controlled the situation. Accordingly, despite many rumors of our domestic market by the building of a synthetic ammonia plant by the German I. G. interests within the United States, it was wise for the American industry to make haste slowly.

American Apathy Towards Ammonia

Except for the Du Ponts, who had their own ammonia plant, American nitric acid makers were apathetic towards the Ostwald process. The stimulus of direct competition with the more modern, more efficient ammonia oxidization process of acid manufacture was lacking. Chile nitrate was falling in price and sulfuric acid, in abundant supply. Naturally enough American makers were loath to send valuable equipment to the scrap heap and invest in costly new apparatus. There was accordingly, no ammonia demand for nitric acid manufacture.

Nor was the fertilizer demand more encouraging. American agriculture was in the doldrums. The fertilizer industry, already sorely over-produced, was in no position to experiment with new materials. The farmers did not at first take kindly to highly concentrated plant foods and there was an active prejudice in favor of natural, as contrasted with chemical, ammoniates. Finally, insistent agitation by the farm bloc in Congress was urging the Government to operate the war-built cyanamid plant at Muscle Shoals, and to sell nitrate fertilizers at cost as a farm relief measure. For years this proposal hung like a sword of Damocles over all plans to develop privately owned nitrate operations in America.

I. G. Statement

The I. G. issued a statement during the month to the effect that it has been able to offset its losses in business, due to the decline in activity in the textile industry, because of added demand growing out of the swing of styles to the darker shades and favorable business in various special industries, notably paper.

Rayon prices, the statement points out, have receded further under the pressure of foreign competition. International agreements in rayon, it says, have failed to stabilize prices.

The general position of the I. G. organization, considering the severe depression existing everywhere, is satisfactory, according to the statement.

The I. G. is thought to have felt the sharp recession in sales of nitrogen rather keenly. The German Federal Economic Council, which recently authorized an inquiry into conditions in the local artificial fertilizer industry, finds that almost 40 per cent of domestic produced ammonia had to be stocked at the end of the fertilizer year, June 30, 1930, against 29 per cent in 1928-1929 and 25 per cent in 1927-1928. The decreased price for nitrogen fertilizers fixed by the Nitrogen Syndicate, effective July 1, involves a 5-pfennig drop per kilo of fixed nitrogen, equivalent to 8,000,000 reichsmarks if sales reached the previous year's level.

These figures show that German nitrogen production can be calculated at roughly 60 per cent of a capacity of well over 1,000,000 metric tons annually. A 1930 production of 650,000 tons of pure nitrogen would be distributed between agriculture, taking 400,000 tons, and industry, absorbing 100,000 tons, with an export overflow of 150,000 tons. The inquiry revealed that over one billion reichsmarks is invested in fixed nitrogen production facilities.

Associations

January was rather a quiet month in the news of the chemical associations and societies, no conventions of importance being held. The principal items of interest were the presentation of the Perkin Medal to Arthur D. Little on January 9, and the election of Percy C. Magnus to the chairmanship of the Drug and Chemical Section of the New York Board of Trade, January 7.

Little, 1931 Perkin Medalist

The chemical industries, "still in their first youth, with their great development still before them," will lead the advance to prosperity, Dr. Arthur D. Little declared in his address at a joint meeting of the chemical societies in Havemeyer Hall, Columbia University, when he formally received the Perkin Medal.

"Since advances in chemistry react on every industry, while, conversely, every progressive trend in other industries makes new demands on chemistry," Dr. Little said, "we may look with confidence to the chemical industries for contributions which should go far toward supplying the stimulus essential to the revival of our prosperity, and which the stationary or obsolescent industries can no longer furnish."

Dr. Little is vice-chairman of the Engineering Foundation Board, chairman of the Advisory Committee of the National Exposition of Chemical Industries, a member of the Division of Engineering and Industrial Research of the National Research Council, and chairman of the Committee on Economy of Fuel and Raw Materials of the American Section of the International Chamber of Commerce. He is one of the consulting editors of CHEMICAL MARKETS. He has served as a member of the Advisory Board of Superpower Survey, U. S. Geological Survey. He was president of the Alumni Association of the Massachusetts Institute of Technology in 1921-22, and was made a life member of the Corporation of that institution in 1923.

Dr. Little is a member of the American Chemical Society, of which he was president in 1912-14; the American Institute of Chemical Engineers, president, 1919; Society of Chemical Industry, London, president, 1928-9; Chemical Society, London; Societe de Chimie Industrielle, New York Section; American Electrochemical Society; American Petroleum Institute; Institution of Petroleum Technologists, London; Institute of Fuel, London; American Gas Association; American Society of Mechanical Engineers; American Institute of Mining and Metallurgical Engineers; Engineering Institute of Canada; American Association for the Advancement of Science; American Academy of Arts and Sciences; the Franklin Institute; and the Royal Society of Arts.

The Perkin Medal was founded in 1906 at the time of the Perkin semi-centennial celebration of the coal-tar discoveries, the first medal being awarded to Sir William H. Perkin himself.

The Society of Chemical Industry, the American Chemical Society, the Societe de Chimie Industrielle, and the American Electrochemical Society participated in the January meeting. Other speakers were Prof. Frederick G. Kayes of Massachusetts Institute of Technology, who discussed the work of the medalist, and Prof. Marston T. Bogert, Columbia, who presented the medal.

History Repeats Itself

"WHAT do you consider has been the outstanding characteristic of the American Chemical industry during the last ten years?"

Undoubtedly, should our own Inquiring Reporter go, for example, from table to table during the luncheon hour at the Chemists Club in New York, and ask this question, he would receive, in a great number of instances, perhaps a majority, the answer: "Consolidations."

Yet such replies, contrary to general belief, are only half truths.

Glancing through a February issue of Drug & Chemical Markets of ten years ago, one notes a large number of names that have not changed. A more detailed check-up of the industrial chemical companies that were advertisers then shows that now twenty-one per cent are out of business; ten per cent have merged with other companies, leaving sixty-nine per cent who have retained their complete identity. Moreover a percentage are still operating under their original names, though now a part of larger consolidations. Kalbfleisch and Rhodia are two examples of such companies.

The rate of survival, as measured by the advertisers appearing on the front page of the February issue, is one hundred per cent, W. J. Bush, Battelle & Renwick, Mallinckrodt, Merck, Wm. S. Gray, U. S. Industrial Alcohol and Monsanto answer "Present" in the chemical roll-call with loud and vigorous voices.

Thumbing over the pages, however, names do appear that already are recalled only with difficulty, Montcalm Chemical Works of Indianapolis, manufacturers of intermediates, represent houses of this group. Of course everyone, (except those whose entrance into the industry is of very recent date) remembers Butterworth-Judson, one of the bouncing "War-babies" of the chemical industry. The extensive plants in the Newark meadows, now housing several diversified industries and commercial warehouses, are grim reminders of the days when the mineral acids, and coal tar intermediates were sinews of war and as such were in such urgent demand that several million dollars were invested in a factory to produce them.

In the jobbing field the mortality has been specially high. This is a direct result of changing merchandising methods within the industry. A few such names are S. L. Jones & Company, B. G. Feinberg, The Keene Company and Bush, Beach and Gent. The last head their advertisement with the statement, "A contract is a contract," a sharp reminder of an unpleasant aspect of the depression of a decade ago when many agreements written in the heat of a war period were finally settled in the courts. In many ways the present period of depression is fortunately different from that of ten years ago.

Turning back to Page 233 of Volume VIII we can read the advertisement of A. Klipstein & Company featuring a statement of the then Governor of the Federal Reserve Bank, W. P. G. Harding. The article is headed, "Future is Bright," and reads as follows: "Present conditions, I think, justify some conclusions which ought to encourage and hearten us all. Our banking position is sound and stronger than it has been for many months, and the business community which has been first over exhilarated and then unduly depressed, has recovered its normal state of mind. Public sentiment today undoubtedly approves of working back to normal. Whatever danger of crisis there may have been has been passed. The gloomy forebodings which many felt a year ago because of the knowledge that readjustments were impending have given way, in the assurance that the most trying and critical stage of the readjustment period is safely over, to a feeling of conservative optimism, renewed courage and restored confidence. In such a spirit let us all work together to make the 1921 a year of constructive achievement."

How can anyone remain in a pessimistic frame of mind after reading this quotation, one that might very appropriately be applied to conditions today, ten years after it was originally uttered. Sandwiched in between these two bad periods, the country has enjoyed the most prosperous years in its history.

But depression periods are but one of several historical repetitions that are quite evident in turning over our yellowed pages of February, 1921.

In the news section, such headings as, "Prohibition on importation of dyestuffs into England, "Europe's Buying Power Paralyzed," "Senate Seeks Fertilizer Facts," "New Checks on Withdrawals of Alcohol," "Slump in the Volume of Buying," "German Chemical Market in Weak Position" are nearly duplicated in our January, 1931, number. There we find England again struggling with the question of maintaining or rejecting protection for the dyestuffs industry; Doctor Roth, Editor of the *Chemiker Zeitung* relating the dejected condition of the German industries; the Senate still conferring on fertilizer and Muscle Shoals, and the Bureau of Industrial Alcohol announcing the final adoption of the new alcohol regulations. Truly there is little new under the sun after all. What is thought to be new is merely the old dressed up a little differently.

A large tin mine in New Zealand

Metal Statistics as an Aid in Buying Chemicals

CHEMICAL prices during 1930 were profoundly affected by the extraordinary decline in the metal markets, emphasizing to what extent the ruling prices for tin, zinc, lead and copper influence quotations in the heavy chemical markets.

The price relationship between the metal and its metallic salts is closer for some metals than in others. For example, quotations for tin salts are adjusted at least twice a month keeping the market for the salts closely attuned to the price of the metal, while copper sulfate producers commonly adjust schedules within a few days, whenever the metal market registers a more than fractional change. In the case of zinc and lead salts price changes are less frequent. As the metallic base becomes higher in price, the more frequent, generally speaking, are changes made in schedules. This is quite obvious when the so-called "baser" metals are considered, lead, zinc, copper and tin.

Vital to Intelligent Purchasing

Few chemical consumers, were those dealing in large tonnages produced directly from metals, follow the trend of the metal markets, or are even reasonably well informed on metal statistics and the probable trend in prices. Yet, such information is vital to intelligent and economical purchasing of many of the most important heavy chemicals. Often price changes in industrial chemicals can be foretold with reasonable accuracy several months in advance from a thorough knowledge of metal prices and an understanding of metal statistics.

These statistics are really not difficult to obtain and they enjoy a reputation for accuracy quite exceptional in chemical fields. The government and producers of lead, zinc, and copper, co-operate closely, and a wealth of statistical material, such as monthly production figures, monthly consumption, and stocks on hand, are quickly gathered and made available. Only one or two branches of the chemical industry, such as the yearly dye and intermediate census and the monthly figures on acetate of lime and natural methanol, even attempt to approach the thoroughness of the figures available on the baser metals.

Past Year's Decline Figures

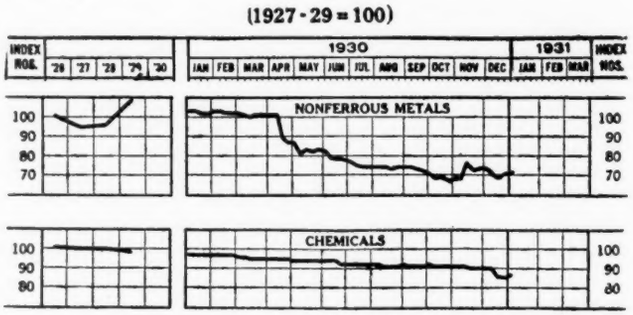
A study of the high and low prices for the four metals, zinc, lead, copper, and tin, indicate quite clearly the severity of the past year's decline.

Zinc, slab, (New York) high, 5.8 cents; low 3.95 cents, a drop of 32 per cent and a decrease of 41 per cent from 6.6 cents, the 1927-1929 average.

Lead, pig, (New York) high, 6.25 cents; low, 5.05 cents, indicating a decrease of 20 per cent from the 1930 high, and 24 per cent from the 1927-1929 average of 6.6 cents.

Copper, electrolytic, high $17.75 cents; low, 9.5 cents, indicating a decrease of 47 per cent from the year's high and 39 per cent from 15.5 cents, the 1927-1929 average price.

Tin, pig (New York) high, 39⅝ cents; low, 23½ cents, a decrease of 49 per cent from the high, and a decrease of 57 per cent from 53.3 cents, the 1927-1929 average.

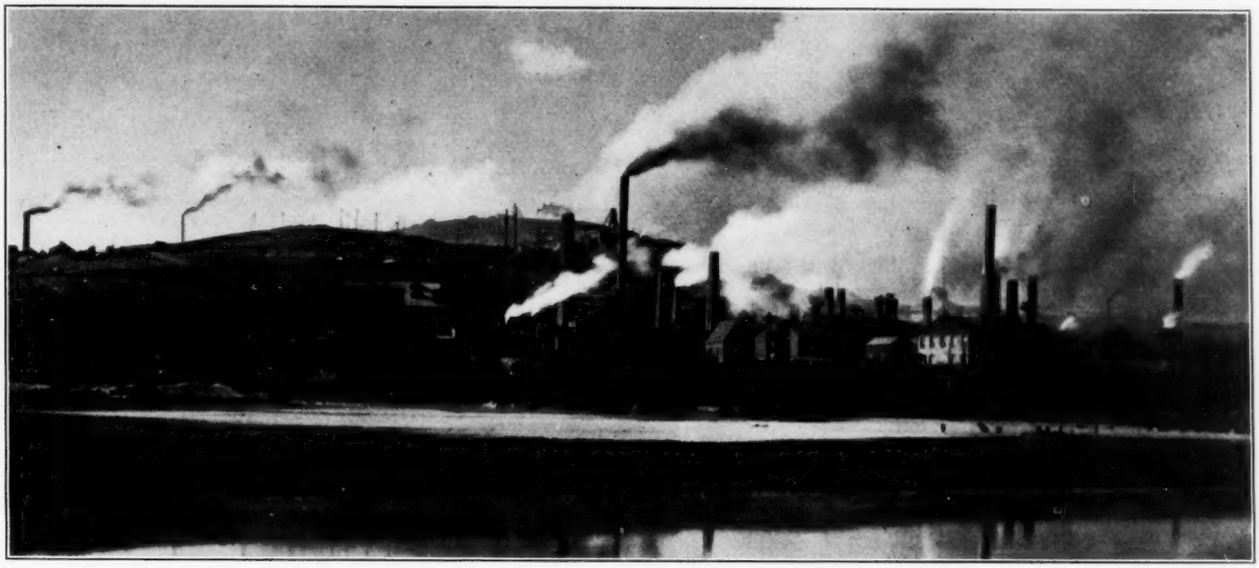


An interesting comparison between the price trend of the nonferrous metals and industrial chemicals. This chart and those on page 156 are from the "Journal of Commerce"

A similar comparison with an important salt of each of these metals: zinc oxide, high, 7⅝ cents; low, 6.5 cents, a decrease of 15 per cent; lead acetate, white crystals, high 14.5 cents; low, 11.5 cents, a decrease of 21 per cent; copper sulfate, high, $5.50 a hundred pounds and $3.95 low, a decrease of 29 per cent. Finally, tin oxide, high, 42 cents; low 38 cents, a decrease of 34 per cent.

commodities", but also that industrial chemicals derived from the combination of a metal (tin, copper, lead and zinc) and non-metal have shown a much greater loss than the general average of all types of industrial chemicals.

Of the four metals under consideration, lead was less severely affected by the 1930 depression than either copper, zinc or tin.



The serious decline in the price of copper has profoundly affected the industry in the United States. A large smelter in Montana operating at capacity before the break in the metal market

Arranging these percentages for comparison we have:

Metal	*Per Cent Loss in 1930*	*Chemical*	*Per Cent Loss in 1930*
Lead	20	Acetate	21
Zinc	32	Oxide	15
Copper	47	Sulfate	29
Tin	49	Tetrachloride	34

Further investigation of these figures disclose some very interesting comparisons. The lead salt in its 1930 decline comes closest to approximating the drop in the metal. But lead is next to the cheapest of the group of four metals. Again the lead salt is the only chemical of the four compared to have a larger percentage loss than its corresponding metal. In the case of the others, the percentage of loss in the metal is far greater than for its chemical derivative. In the case of zinc, for example, the loss is greater by more than 50 per cent. This would seem to indicate, other factors remaining stable, the possibility of lower prices in such chemicals as use these metals as a base.

A recent survey of 1930 prices of fifteen representative chemicals made by CHEMICAL MARKETS shows an average decline of only 7.3 per cent, while general basic commodities of all types declined 23.6 per cent. The average loss for the four metals amounted to 37 per cent and their representative chemicals 24¾ per cent. Thus it is quite evident that not only have the baser metals declined proportionally greater than "all

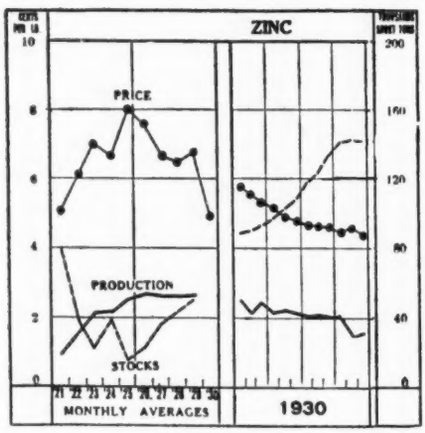
The output of lead was only 15 per cent below the 1929 total, zinc showed a reduction of 20 per cent and copper 19 per cent. The withdrawals of lead, as reported by the United States Bureau of Mines, were only 16 per cent less than in 1929, whereas withdrawals of both copper and zinc for domestic consumption were approximately 28 per cent less than the previous year. It is rather difficult to make an intelligent comparison of the output of tin with the above figures, which are for domestic production while practically our entire supply of tin comes from abroad.

The output of primary lead from domestic sources was the smallest since 1924 and that from domestic and foreign sources the smallest since 1923. Indicated domestic withdrawals were lower than in any year since 1923. It would appear therefore that of the four metals lead alone made anything resembling a successful attempt to balance production against consumption in 1930.

The output of primary domestic de-silvered lead was about 324,000 tons, of soft lead about 200,000 tons, and of de-silvered soft lead about 45,000 tons, making a total output from domestic ores of about 569,000 tons of refined lead. Similar figures in 1929 were 381,487 tons of de-silvered lead, 235,345 tons of soft lead and 55,666 tons of de-silvered soft lead, a total of 672,498 tons.

The following table shows the production shipment, and stocks on hand of lead in 1930:

	Production			
	From domestic ore	*Secondary & foreign*	*Total production*	*Stock at end*
January	49,991	9,327	59,318	47,756
February	54,125	6,226	60,351	43,077
March	56,552	8,600	65,152	42,469
April	55,547	8,520	64,067	42,015
May	52,818	6,352	59,170	49,638
June	50,721	4,965	55,686	55,501
July	51,538	4,666	56,204	62,880
August	52,980	5,056	58,036	72,832
September	48,491	4,746	53,237	73,669
October	50,402	4,967	55,369	84,375
November	43,423	5,565	48,988	90,402
December	48,517	4,692	53,209	103,247
Total	615,105	73,682	688,787	.....



A graphical representation of the situation in the zinc market

Below, similar statistics on tin and copper

Production of primary zinc from domestic and foreign sources and apparent deliveries for domestic consumption stood last year at the lowest figures reported since 1922. Stocks of zinc at smelters and at electrolytic refineries were nearly doubled during 1930 as shown in the following statistics and as 1930 closed they were the highest on record.

Domestic Ores in 1930

The output of primary metallic zinc from domestic ores in 1930, as reported by producers from actual production figures for eleven months and December estimated, was about 500,000 tons. Supply from foreign ores was about 8,200 tons, making approximately a total of 510,000 tons. In comparison with 612,136 tons from domestic ores and 13,311 tons from foreign ores, a total of 625,447 tons in 1929, the decrease is very close to 20 per cent. In addition to the output of primary zinc, about 34,800 tons of redistilled secondary zinc was produced, as compared with 47,348 tons in 1929.

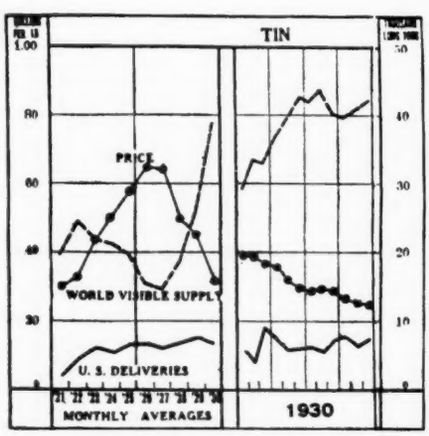
The following table shows production, shipment and stocks of zinc by months during 1929 and 1930:

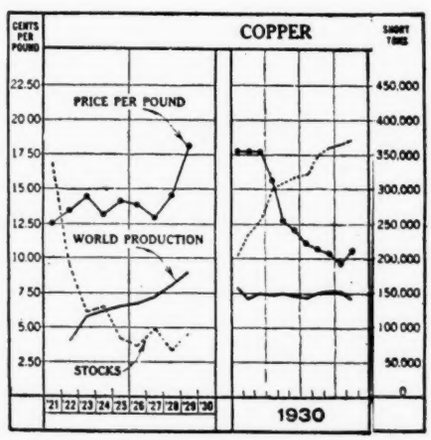
		Shipments	
1930:	*Prod.*	*Total*	*Stocks*
January	52,010	40,704	86,736
February	44,628	41,296	90,068
March	48,119	41,820	96,367
April	44,435	40,597	100,205
May	44,556	38,681	106,080
June	43,458	36,448	113,090
July	40,023	35,358	117,224
August	41,012	31,901	126,835
September	40,470	32,470	134,835
October	40,922	32,430	143,327
November	32,097	30,285	145,139
December	32,682	34,245	143,576
Total, 1930	504,412	436,266	
1929:			
January	50,862	50,234	47,058
February	48,057	52,395	42,720
March	55,008	58,463	39,364
April	55,203	58,334	36,233
May	57,475	58,226	35,482
June	52,532	49,182	38,832
July	54,447	47,943	45,336
August	55,708	51,980	49,064
September	51,994	47,202	53,856
October	54,513	48,777	59,592
November	48,411	43,148	64,855
December	47,292	36,717	75,430
		692,601	

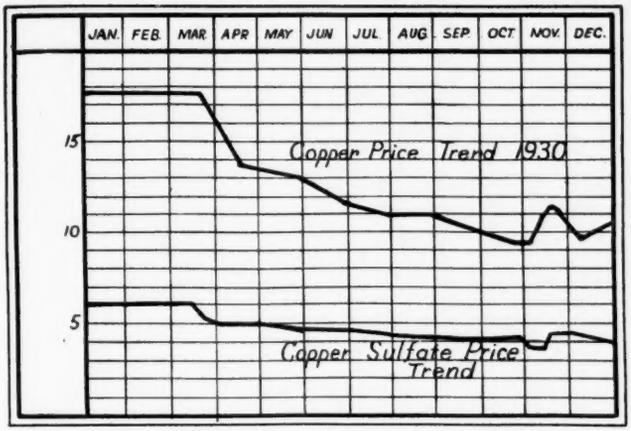
Copper Figures

In the case of copper, both production and consumption were at a lower rate in 1930 than in 1929. Of greater significance is the fact the decline in production lagged behind that in consumption by a wide margin. Stocks of refined copper on hand at the end of the year were the largest of any ever recorded.

The total primary and secondary output of copper by the refineries was 19 per cent lower in 1930 than in 1929, being about 2,480,000,000 pounds for 1930 and 3,074,000,000 pounds in 1929. Refineries reported that at the end of 1930 approximately 667,000,000 pounds of refined copper were in stock, more than twice the carry-over of only 306,000,000 pounds at







Graph showing how the salt of the metal follows the trend of the metal market

the close of 1929. When it is remembered that this latter figure was in turn well over two and one-half times the amount on hand at the end of 1928, the extent of the decline in actual consumption during 1930 becomes more readily appreciable.

A summary of the comparison between 1930 and 1929 is as follows:

New Refined Copper Withdrawn from Total Year's Supply on Domestic Account, 1929-1930, in Pounds

	1929	*1930*
Refinery production of new copper from domestic sources	1,983,000,000	1,485,000,000
Refinery production of new copper from foreign sources	757,000,000	745,000,000
Imports of refined copper (December, 1930, estimated)	134,000,000	89,000,000
Stocks of new refined copper on January 1	114,000,000	306,000,000
	2,988,000,000	2,625,000,000
Exports of refined copper (ingots, bars, rods or other forms) (December, 1930, estimated)	903,000,000	681,000,000
Stocks December 31	306,000,000	667,000,000
	1,209,000,000	1,348,000,000
Total withdrawn on domestic acct.	1,779,000,000	1,277,000,000

Zinc Most Severe Sufferer

A study of the comparative shrinkage of metal prices during the year shows that of all of the non-ferrous metals, zinc has suffered most severely during the current slump in world trade. While it is quite true that copper, lead and tin have descended to abnormal low levels, yet the 1930 average zinc price was lower than in any preceding year ever recorded. Previous to last year's new low, the low record was held by the 1884-1886 period.

The stocks of zinc on hand as of November 1, 1930, indicated a little over a month's supply in Europe and more than four months' supply in the United States, our stocks totaling about 60 per cent of the World stocks.

Delving a little further into the statistical figures for the non-ferrous group, it is apparent that the serious decline in world prices has been seriously affected by the bad balance of output and consumption. Tin for example was selling as the year closed at a price in the neighborhood of $525 a ton against an average price of $1,250 for the last fourteen or fifteen years. Actual production costs are said to be close to $900 a ton. As 1931 opened, the world supply of tin was estimated at 50,000 tons or more than four months' supply in normal times.

When reasons for the weakness in zinc prices are sought it is found that, in addition to over-production in the face of diminishing demand, in the last three years a major change has taken place in the zinc industry itself. Fundamentally the cause was the introduction of the selective flotation treatment of ores. Now it is a very simple problem to handle complex ores which had heretofore defied treatment. Further, this process caused the operation of many lead-zinc properties that were formerly unprofitable, with zinc becoming a by-product of lead. At many lead refineries, the zinc is considered purely as a by-product and any proceeds derived from its sale as being just so much additional profit. Further still, the introduction of the electrolytic method of production is expanding at the expense of the distillation method.

Efforts were made during 1930 to bring production of each of these four metals more closely in line with actual needs. Some definite gains were made, but actual results fell far short of the anticipations of the producers. Tin producers met quite early in the year at London and agreed upon curtailment, So far short were they, however, from accurately gauging the drop in consumption that in less than six months several of the more important members of the cartel were urging a further restriction of 25 per cent.

Copper producers in the United States finally agreed to a curtailment of approximately 20,000 tons a month in the latter part of the year, but aside from aiding in temporarily halting the decline in price the result of such action appeared to gain little towards bringing stocks more nearly in line with immediate needs. It must be remembered that the copper situation is further complicated by the fact that copper is on the free list and as such must compete with the world markets whereas both lead and zinc are afforded tariff protection. At the moment it would appear that lead appears to be in the best statistical position of the four metals. While the immediate position of the tin market is unfavorable it is more likely that any scheme of curtailment will be more faithfully and effectively carried out than in the case of the other non-ferrous metals, as the number of producers and producing countries are fewer. In the case of copper a revival of building activity on a broad scale would undoubtedly improve the statistical position of the metal. The future for improvement in the zinc market appears to be a more serious problem.

Coal
As a Raw Material

By Dr. E. F. Armstrong*

WITH some clue to the nature of coal we can start, from a logical basis, to use it to the best advantage. Merely to burn it as we do now, especially in the domestic grate, is a crime. If the enormity of this offence is not yet understood by the people, at least the chemist realizes its import, and the progress made, going no further back than the last decade, is all to our credit. In industry at least, in cooperation with the fuel engineer, we have learnt how to burn coal efficiently, and in many instances the same results are achieved with less than half the amount of coal. It is well to emphasize that every strike, every increase in the price of coal, results in further efforts being made to burn less or even do without it altogether. Such efforts will always be successful, for, as we all know, invention is far ahead of its application in this particular field. I wish to avoid the political, economic and sociological troubles of our coal industry, which are slowly and surely destroying it, though one must emphasize that the cost of mining is at least 50 per cent more in this country than it is in America.

Suitability to Purpose

Can the chemist come to the rescue ? How are we to find new or better methods of utilizing our coal to advantage ? From the point of view of the user there is much still to be done in studying the nature of the coals from every colliery, even from particular seams, and seeing that they are applied to their most suitable purpose for which they should realize a small premium. In gas-making, for example, it is imperative to select suitable coals, a different type being required for horizontal than for vertical retorts or for chamber ovens. Only certain coals are suitable for low-temperature carbonization or for furnace or boiler work. To ensure constancy of coal quality, it is often necessary to blend coals if a carbonizing plant is to be operated under the best conditions. It is illogical and uneconomic to burn any coal in a factory because its delivered price is the lowest, irrespective of performance. Collieries and coal factors should imitate the vintners and know more of the goods they sell, for it is only after purchase that the smaller user finds out the facts: the large consumers are, or should be, educated by this time to the necessity of maintaining a testing laboratory for its fuel, which is examined before or at least during transport, so that already on arrival at the works it can be handled with due regard to its utility. Such questions as coal cleaning and the economic futility of carrying waste mineral material and ashes on long sea and railway journeys I do not propose to discuss: they are of great importance, and they have not been neglected in the Newcastle area.

Increasing the Value of Coals

How can we enhance the value of coal ? Besides burning it in the raw state we can:—(*a*) Carbonize it to make towns gas; (*b*) treat it in coke ovens to make coke; (*c*) carbonize it at low temperatures to fuel and oil; (*d*) hydrogenate it or the oils from it. These processes all give some products in addition to those used as solid fuel: they avoid the production of smoke and the loss of volatile valuable constituents in this. They have the disadvantage that some of the heat in the raw coal is used in carbonizing, and that elaborate and costly plant of relatively short life is required.

The raw materials resulting from carbonizing are a matter of everyday knowledge—ammonia, benzol, crude materials for dyes and pharmaceuticals; phenols and cresols for synthetic resins; tar for wood preserving, for roads; pitch—are among them. The multitudinous uses of gas and its advantages both for lighting, cooking, and heating require no eulogy, and yet the public uses only a tithe of what should be burned. Raw coal should be forbidden in a town—it would be if we had any conscience and eschewed politics in local government. We cannot surely go on very much longer cheerfully letting 72 per cent of the sulfur in coal go into the atmosphere as sulfuric acid—a calculation by Dr. J. S. Owens, suggests that

*Delivered at Armstrong College, England, at a joint meeting of the Newcastle section and the Northern Coke Oven Managers' Association

the alarming figure of three to four million tons of acid annually are discharged from domestic fires alone, together with half a million tons of tar, the two products having a round value of £100 million per annum. Gas has most of the sulfur removed from it, nearly all could be, if necessary; when delivered of constant calorific value, constant density, and at a constant pressure, standard fittings requiring no adjustment could be used.

Coke Has Great Future

Coke has a great future, but the term at present has too vague a meaning—some label of quality must be attached to it, so that, on the one hand, the gas works or the coke oven turn out a substance of never varying standard quality, and, on the other, it is discovered how to make individual cokes suitable for special purposes. Herein is a field for the chemist the problems are known, they have been in many instances solved, and yet there is a lag, a certain sluggishness or lack of willingness to meet the demand. Apart from the well-established uses of coke, there will be a great demand for it soon for producing water-gas, a process in which the reactivity of the coke to steam plays a most important part. This question is now properly receiving attention in a number of quarters.

It is some little time since Sabatier's famous book on catalysis in organic chemistry focused attention on what could be achieved by means of these aids to synthesis; only now are we beginning to realize that such syntheses can start from the very simplest of carbon compounds—carbon monoxide, carbon dioxide, methane, acetylene, and ethylene. To produce these from coal or coke in unlimited quantities, of sufficient purity, is the problem of the day; only one other raw material is essential, viz., hydrogen. There is no need here to enumerate the simpler organic substances which have already been synthesized and manufactured, or are in the course of so being from the primary carbon gases. A new era in synthetic organic chemistry is opening, one in which Britain will have unlimited raw materials derived from its coal on equal terms with other nations, provided always that its raw coal also is placed on rail at the surface at competitive world prices. If we fail here then truly the worst must happen.

The distillation of coal at low temperatures has proved a difficult problem both technically and economically. Even to-day the domestic market is not yet educated to the merits of the main product, smokeless fuel, whilst the secondary product, oil, requires costly further treatment to give it the enhanced value at first anticipated. Not every raw coal is suitable for treatment; plant and other difficulties are considerable, and it was not until quite recently that the question was studied by those most competent to deal with it—the experienced engineers and chemists of the gas industry. It is worth emphasizing that much depends on the geographical situation of a carbonization plant. It should be placed primarily with a view to the easy disposal and cheap transport of its products—char, gas, and oil. A suitable coal is an essential, but in the long run it may be found cheaper to haul the coal from the colliery, already equipped with loading and siding facilities, to the carbonization plant than to place the latter at the colliery. This experience has been dearly bought by the coke-oven industry, which in America has the location of its plants determined by the above considerations in preference to placing the plant at the colliery. If carbonization plants and coke ovens in the future are concerned largely to make oils and gases for further chemical synthesis, as well as char and coke, then the reason for their location, apart from the colliery, becomes more obvious. I would go so far as to say that the sole business of a colliery should be to produce coal, and that it should have only the managerial staff necessary for this purpose, quite another type of professional man being required for the management of the carbonization or chemical plant.

Power and Carbonization

The relation of electricity undertakings to carbonization plant is a moot point. Whilst there is much to be said for the experts of the former to confine themselves to the production of steam and electricity and its distribution, it is undoubtedly wrong to divorce gas and electricity and make them so sharply competitive as is done in this country. In America, where longer views prevail, the two services are being wedded together—apart from other considerations, which this is not the place to discuss, the economies in manufacture of both commodities, and particularly those in reading of meters and collection of dues are very substantial. Aside from all this, unless power stations are to go on burning raw fuel, it should be proper to associate them with a carbonization plant.

Britain has no natural oil, though some may be obtained by distilling shale or cannel. Why, therefore, seek to obtain it from coal is a fair question to ask both of us and of Germany or of France. Transport is quick, is cheap, employs labor, there is oil to spare. The answer is a known one—the aftermath of the War has left every nation poor, exhausted, resolved to make all it can in its own country, buying the minimum from abroad in order to save depreciation of its exchange. It is agreed, therefore, that Great Britain must produce at least a portion of its oil. Methods of extracting the oil from shale, from cannel, from coal, must be made thoroughly efficient, but the real problem is how to treat the oil so obtained to make applicable as a motor spirit, as a lubricating oil. On the one hand, it can be cracked, but a cracking unit is only economical when on a considerable scale—whereas oil in Britain is likely to be produced in relatively small quantities in many centers. The first desideratum is,

therefore, for a small cracking unit capable of being economically operated on a throughput of a few tons per diem. On the other hand, the oil can be hydrogenated under pressure by what was originally known as the Bergius process, and this appears to offer the most attractive solution of the problem of its enhancement in value.

The direct hydrogenation of coal itself seems a doubtful proposition economically, and it will be more satisfactory first to carbonize the coal under conditions ensuring a maximum yield of oil and a char which can in part be used to make water-gas and hence hydrogen. As already indicated, some low-temperature cokes are by their physical structure especially suited for this purpose. The oil will be hydrogenated in presence of a catalyst such as molybdenum—obviously the patent situation in this field will present some pretty problems.

Whether in the absence of the present protective duty of 4d. per gallon the production of oil from coal will prove to be economic over a period of years it is impossible to say. What should be affirmed, however, is that it is imperative to have the process working in this country.

How, then, do we visualize the future ? Gas, electricity, carbonizing plant, coke oven—all located together, working in harmony with the object of producing electricity for power, gas for heating, either for lighting. No raw coal to be burnt in the towns; coke or char to be supplied for industrial heating. The factory making motor spirit, tar and its derivatives, ammonia and the simpler organic compounds. The sulfur retained at the factory and converted into sulfuric acid. Our cities will be cleaner, healthier, happier; our utilities cheaper, more helpful, more popular; coal will be used to its greatest advantage. How long will this take ? Who will do it ?

The Willard Gibbs Medal, one of the highest distinctions in chemical science, has been awarded for 1931 by the Chicago Section of the American Chemical Society to Dr. Phoebus A. Levene of the Rockefeller Institute "as the outstanding American worker in the application of organic chemistry to biological problems."

The Chilean Nitrate of Soda Nitrogen Research Award, administered annually by the society, has been awarded to Dr. J. J. Skinner, senior biochemist of the Bureau of Chemistry and Soils, United States Department of Agriculture; Prof. L. G. Willis, soil chemist of the North Carolina Experiment Station; and Dr. James K. Wilson, professor of soil technology, Cornell University. The fund of $5,000 was divided equally among the three scientists.

The Electrochemical Society has announced reduced rates on the transactions of the society, prices of Volumes 1 to 60 to non-members, $6.50 per copy; to members who have paid their dues ($10 per year) $1.50 per copy; to members of the Faraday Society and of the Deutsche Bunsen-Gesellschaft who have joined The Electrochemical Society, $2.50 per copy; to public and university libraries, national research laboratories, and to scientific societies, $4.00 per copy.

The two complete Indexes covering the first twenty volumes (1902-1911) and the second twenty volumes (1912-1921) are obtainable at the uniform price of $1.50 per copy.

New York Section Elects

Percy C. Magnus, president, Magnus, Mabee & Reynard, Inc., essential oil dealers, was elected on January 7 to the chairmanship of the New York Drug and Chemical Section of the New York Board of Trade. He succeeds Charles A. Prickitt of the Upjohn Company, who in turn was chosen to represent the section in the Board of Trade. The other officers elected at the meeting were: Vice-Chairman, Francis J. McDonough, of the New York Quinine & Chemical Works; treasurer (re-elected), S. B. Penick, of S. B. Penick & Co.; secretary (re-elected), Ray C. Schloterer. The executive committee for the new year consists of S. W. Fraser, of Burroughs Wellcome & Co.; Edward Zink, of Eli Lilly & Co.; C. Leith Speiden, of Innis, Speiden & Co.; A. Bakst, of Bakst Brothers; Gustave Beyer, of Merck & Co., and Harry J. Schnell, of the Oil, Paint and Drug Reporter. The retiring members of the executive committee are Francis J. McDonough, who was elected to the vice-chairmanship, and A. A. Wasserscheid, of the Mallinckrodt Chemical Works.

Percy C. Magnus

The meeting was also featured by a report on business conditions in the chemical industry in 1930 by Albert A. Teeter, Charles Pfizer & Co. According to Mr. Teeter the present state of trade can be directly traced to the drop in export. The general consensus of opinion at the meeting was one of firm confidence and a belief in a very early improvement in the situation. The Section plans to hold its Sixth Annual Dinner in the Grand Ballroom of the Hotel Commodore on Thursday evening, March 12th.

John D. Rockefeller, Jr., was chosen by the Hundred Year Club of New York City to receive its first gold medal which is to be awarded annually by the organization to the individual who "has done most for the civic and industrial development of the city." This announcement was made at the third annual dinner of the club which was held at the Savoy-Plaza Hotel and which was attended by officers and representatives of leading business houses which have been established a century or more ago.

The following chemical companies are members of the club. American Dyewood Co., Devoe & Raynolds, Dixon Crucible Co., Innis Speiden & Co., Keystone Varnish Co., and Schiefflin & Co.

The recent contributions of the chemist to present day knowledge and use of color in our industrial civilization will be a feature of the Exhibition on the Science and Art of Color which will be given by the Museum of Science and Industry of New York at its headquarters in the Daily News Building at 220 East 42nd Street, New York, January 20-March 15.

The Rayon Institute of America disbanded on January 31 according to E. C. Harrington of the Du Pont Rayon Company, secretary of the organization. The member firms are the Viscose Company, the Du Pont Rayon Company, American Glanzstoff Corporation, American Enka Corporation and Industrial Rayon Corporation.

The Melchett Medal for 1930, the first to be awarded by the British Institute of Fuel under a fund provided by the late Lord Melchett, was presented to Dr. Kurt Rummel, of the Warmestelle, Dusseldorf, Germany, January 23. The presentation was made by Sir David Milne-Watson, president of the institute.

Plant Management

A Department

Devoted to the Business Problems of Chemical-Process Production

A Dividend Payer

In the overwhelming majority of chemical process operations, labor constitutes a minor item of cost. Offsetting this advantage is the pertinent fact that the manufacture of chemicals is notably an industry of special dangers.

As such it has been forced to pay, "through the nose". Insurance rates in states where compulsory accident insurance laws are in existence prove the seriousness and number of accidents occurring in chemical process plants. Labor views with apprehension many of the present industrial processes because of the health and accident hazards involved, demanding compensation in the form of higher wages for the risks assumed. Lastly, but by no means of least importance, is the direct monetary loss caused by absence through accidents and the frequency of labor turnover in many of our chemical plants.

Aside from the humanitarian viewpoint the chemical plant executive once thoroughly aroused to the seriousness of the actual cost to his plant or division for the accidents occurring within his jurisdiction will assume an attitude of personal attention to the means of their prevention. While a serious injury will arouse sympathy and possibly for a time bring about the exercise of greater care, only the continual subjection of the plant executive to dollar and cents facts and figures will bring about definite and successful safety measures.

Safety is a business and not a slogan. To be effective it must be continuous. To be continuous it must be based on a definite plan. The safety engineer is the logical answer even in plants of medium size. Then the problem of direction is the responsibility of one man trained specifically for the purpose. The safety engineer worthy of the name is distinctly an asset and not a liability. His recommendations actually carried out with the wholehearted cooperation of the production executives will result in dividends in the form of savings well worth the time and effort expended in their introduction.

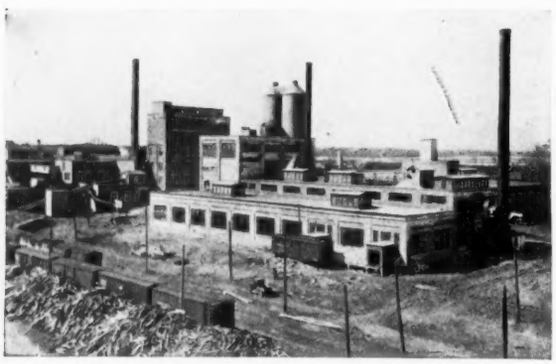
Economies are but one of several benefits accruing from a progressive and well thought out plan. A better product, a smoother running organization, a more contented organization, and a higher type of personnel are to mention but a few of the by-products of safety.

Safety is one of the major problems in chemical plant management, one requiring serious attention from operating executives. It is a responsibility that we cannot shirk or delegate to the gang boss.

In a spirit of cooperation we have enlisted the services of a group of specialists in the chemical division of the National Safety Council to write a series of articles on the various phases of the safety problem. Out of their combined efforts, the result of many years of close and intimate contact with the industry will come concrete and practical suggestions. In the name of humanity, in the cause of better management, and for the sake of the economies effected, let us give to the question of safety the attention it deserves.

To Manufacturers or Users of CAUSTIC SODA

Plant of the Marma Pulp & Paper Co., Marmaverken, Sweden, operating the Dorr Continuous Causticizing System



The Canadian Cellulose Co., in this plant at Cornwall, Ont., operates Dorr Equipment for Continuous Causticizing

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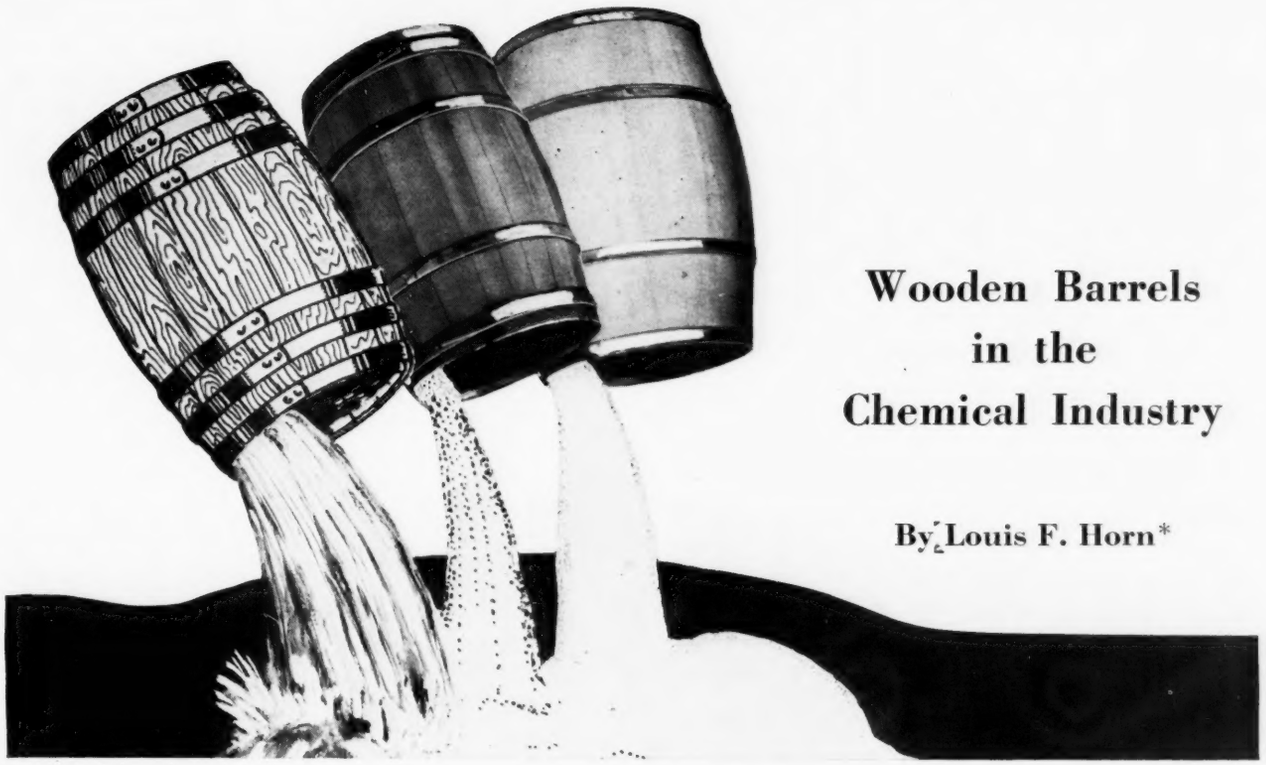


Wooden Barrels in the Chemical Industry

By Louis F. Horn*

AS QUICKLY as the laboratory develops a new chemical product and its commercial value is determined, methods of distribution must be investigated and the proper container chosen to carry that product safely and without deterioration to its destined sales territories. And this question of selecting the right type of container is one which itself also calls for careful research. Shipping regulations, grade of material, and the frequently peculiar characteristics of certain chemical products, often demand specially constructed containers.

The broad use of the wooden barrel in the chemical industry is based on many years of practical experience. This use is in line with established container facts covering the necessary sizes, types and details of manufacture which must be considered in the problems of packing, storing and shipping liquid, semi-liquid, and dry chemicals.

Principles of Wooden Barrel Protection

Starting with the obvious advantage of outside protection from weather conditions and contamination, wooden barrels are made with the definite purpose of performing adequate service under continuous and exacting day-in and day-out use. Simplicity, sturdiness and efficiency are the three major principles of protection afforded. Utility is studied individually in each particular case, and decisions are accordingly based on definite and accurate data procured through cooperation with the chemical manufacturer.

There are two distinct types of barrels, namely, tight barrels that carry liquid and semi-liquid products, and slack barrels that carry dry and semi-dry products.

For the manufacture of tight barrels, white, red and chestnut oak, fir, ash, gum, birch and a few other varieties of timber are used

For the manufacture of slack barrels, elm, gum, cottonwood, pine, basswood, maple, hackberry, tupelo, sycamore and some other species are utilized.

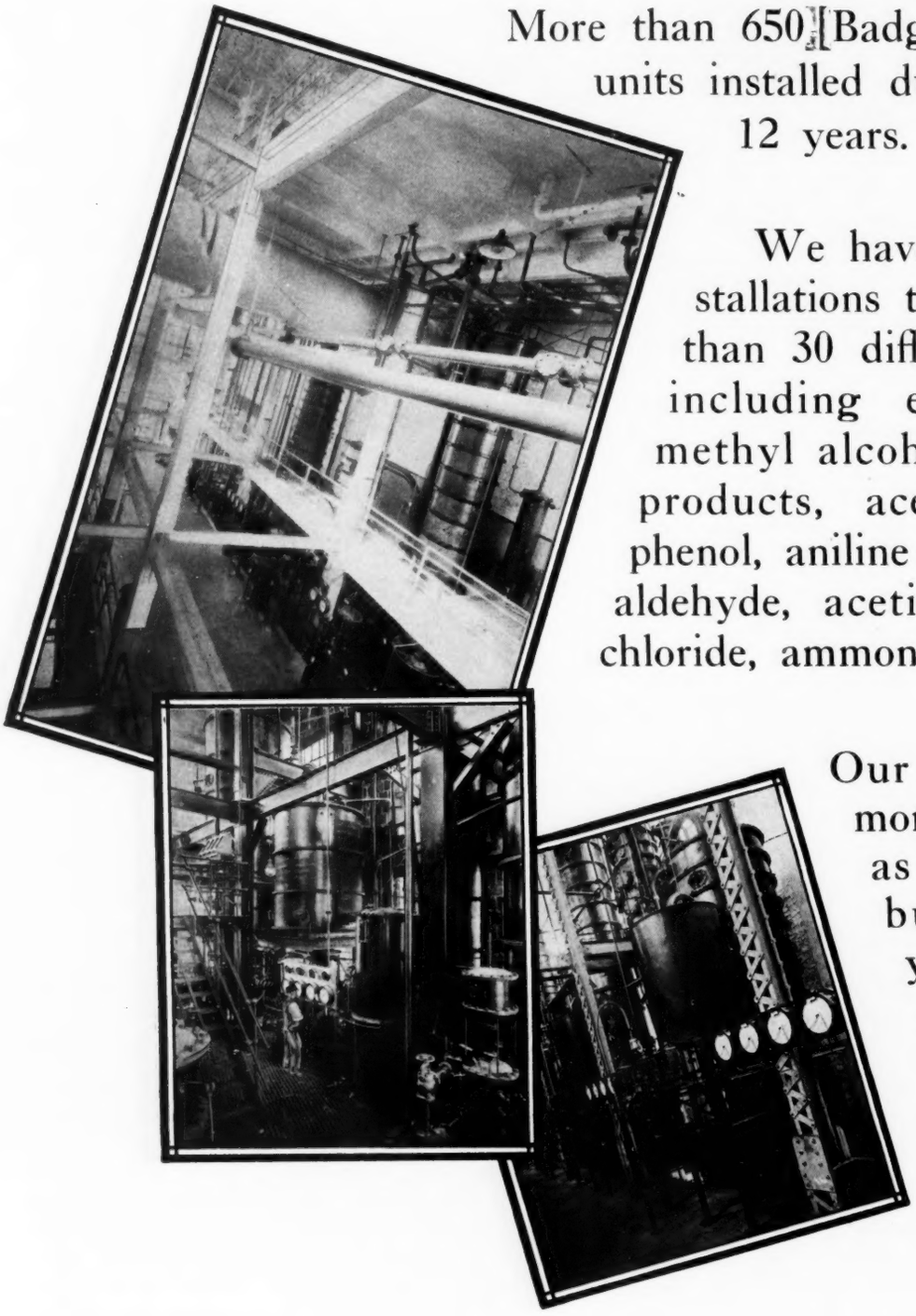
Experience has demonstrated the superiority of first class grade of timber. To determine the species and grade of timber best suited for cooperage, the employment of the standard grade rules adopted by the Associated Cooperage Industries of America as a basis for proper selection, is always advisable.

How Manufactured

Sawing the bolt from the tree with drag saws to required lengths is the first manufacturing operation. Splitting bolts of timber of large diameter for staves and heading is performed by keeping with the grain of the wood. The bolt being quartered and the heart split off, it is placed on the equalizer saw to be cut to desired lengths for staves or heads. These equalized pieces are then passed on to the cylinder saw which cuts the "back" and the "hollow" in the stave in one operation. In the production of slack barrel staves, the process of cutting the stave with the grain instead of sawing, is generally practiced. This operation is made possible through steaming the bolts in steam tubes for many hours to soften the wood. Heading is turned true to size in what is known as a heading

*Secretary, The Associated Cooperage Industries of America

Distillation



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turner. Hoops are coiled, bent, flared and riveted according to the material of which they are made (wood, steel, wire) and the barrel which they bind.

Piling the staves and heading in the open, under cover, for air drying, preparatory to kiln drying treatment, is of vital importance, because it is necessary that cooperage material be as nearly uniform as possible in moisture content before it is placed in the kiln. A proper balance of temperature, humidity, and circulation of heated air is carefully maintained in the kiln, so that the stock may be evenly dried and with a uniform absence of moisture. Jointing the staves is one of the most important operations contributing to the proper manufacture of barrels, for on this process depend the ultimate utility and durability of the finished package.

Proper method of handling barrels from dock to shipboard

Constant research has made possible the development of equipment and machinery for mass production of cooperage material, as well as finished barrels. Up to about 75 years ago hand methods of preparation of material and manufacture of barrels, were exclusively employed. Since then, the machine age has contributed its quota of efficiency to the cooperage industry, but by no means has it exhausted its possibilities for future development.

The manufacture of wooden barrels is worked out along engineering principles developed centuries ago, and these principles remain substantially unchanged after all these years. Withal they are regarded as a "high spot" in engineering technique.

Built on Double Arch Principle

The "arch" principle is the first fundamental in barrel construction. As each stave rests in position with its neighbor, and all are bound together by external hoop pressure, the entire assembly becomes a compact unit, embodying what is known as the "double arch" principle—one arch formed vertically by the bend or bilge of the staves, and the other horizontally when the complete circle of staves is bound together by outside hoop pressure. The wooden barrel is the only container possessing this amazing engineering principle which has come down through the centuries and has withstood the genius of man to improve upon it. It represents a design that has made the wooden barrel a popular type of container in the chemical industry.

Steaming the raised tight barrel or heating the slack barrel with fire, is preformed for the purpose of bending the staves into bilge or arch form. Tight barrels after being shaped by the steaming process are also fired to extract the moisture and to prevent shrinkage.

Both types of wooden barrels—tight and slack—are employed by the chemical industry for packing, shipping and storing its many products and raw materials.

In selecting barrels for packing chemical products, it is always advisable for the chemical producer and the barrel manufacturer to get together, combining the accumulated experience of the maker and the intimate knowledge of his product acquired by the chemical producer, so that the proper kind, size and grade of container may be selected.

Slack Barrels

The slack barrel is employed in the chemical and process industries to pack, carry and store dry, semi-dry and powdered materials, among which may be mentioned the following:

Alum	Lead, Arsenate
Ammonium Chloride	Lead, Oxide
Ammonium Bicarbonate	Mineral Rubber
Barytes	Potassium Bicarbonate
Bleaching Powder	Bicarbonate of Soda
Baking Powder	Sodium Carbonate
Chalk	Sodium Fluoride
Charcoal	Sodium Disulfate
Calcium Chloride	Sulfur
Dry Colors	Sodium Triphosphate
Glauber's Salt	Sulfuret Antimony
Graphite	Soda Ash
Lithopone	Sodium Nitrate
Litharge, Sublimed	Zinc Oxide
Lead White, Sublimed	Borax

and many other chemical products.

The considerable variation in the density of these chemicals and in the manner of their preparation for shipment demands careful specification. The Associated Cooperage Industries of America has estab-

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lished grade rules and specifications adopted as standard for the manufacture of slack barrel staves, heading and hoops. These standard materials are combined by the barrel maker to build a container that will fill the requirements of a certain poundage or gallonage of chemical products. While the straight jointed slack barrel is used for a large number of materials, the "tongued and grooved" barrel has gained considerable favor for packing finely powdered chemical products. The staves and heads are assembled, tongued and grooved, the tongue of one piece of material fitting into the groove of its neighbor, the head being glued, making the barrel air tight and moisture proof. For finely powdered chemicals, this barrel is paper-lined, to prevent sifting. For certain chemicals, silicate is used to seal the wood pores.

The specifications of Slack Barrels most commonly used in the chemical industry are:

13-¾" head	24"	staves
17-⅛" head	28½"	staves
17-⅛" head	30"	staves
19-⅛" head	30"	staves
20" head	34"	staves

Poundage varies according to kind of chemicals packed.

For packing certain poisonous chemicals, insecticides, arsenate of lead, etc., the Interstate Commerce Commission has established, in cooperation with both the chemical and cooperage industries and the Bureau of Explosives, standard specifications designated as 11A and 11B. These specifications have been revised, effective October 1, 1930, as follows:

Shipping Container Specifications 11A

Wooden Barrels and Kegs, (Slack)

1. Manufacture and materials must be well adapted to producing uniform product. Staves and heading must be well fitted together and the completed package must be sufficiently tight to prevent escape of contents of container in transit. If necessary, container must be lined to secure tightness.

Staves and Heading

2. Woods used shall be classified as follows:

Group A		*Group B*
Oak	Sycamore	Basswood
Beech	Hackberry	Cottonwood
Maple	Birch	Tupelo Gum
Elm	Douglas Fir	Pine
Red Gum	White Ash	Chestnut

Staves

3. (a) Staves must be No. 1 grade as generally known to the trade, of uniform thickness, well equalized, circled and jointed, free from knots, slanting shakes, worm holes, dozy wood, and other defects.

(b) Staves must be thoroughly and uniformily kiln dried and tongued and grooved.

(c) Number of staves in any container must at least equal the number of inches in diameter of head, and as follows:

Kind of Wood (group)	*Maximum Length (inches)*	*Maximum Width (inches)*	*Minimum thickness (number of staves to total thickness inches)*
A	24	5	5 staves to 1-⅞ inches
A	29	5½	do
A	34	5½	do

Tongued and grooved chemical barrels for dry and powdered chemicals

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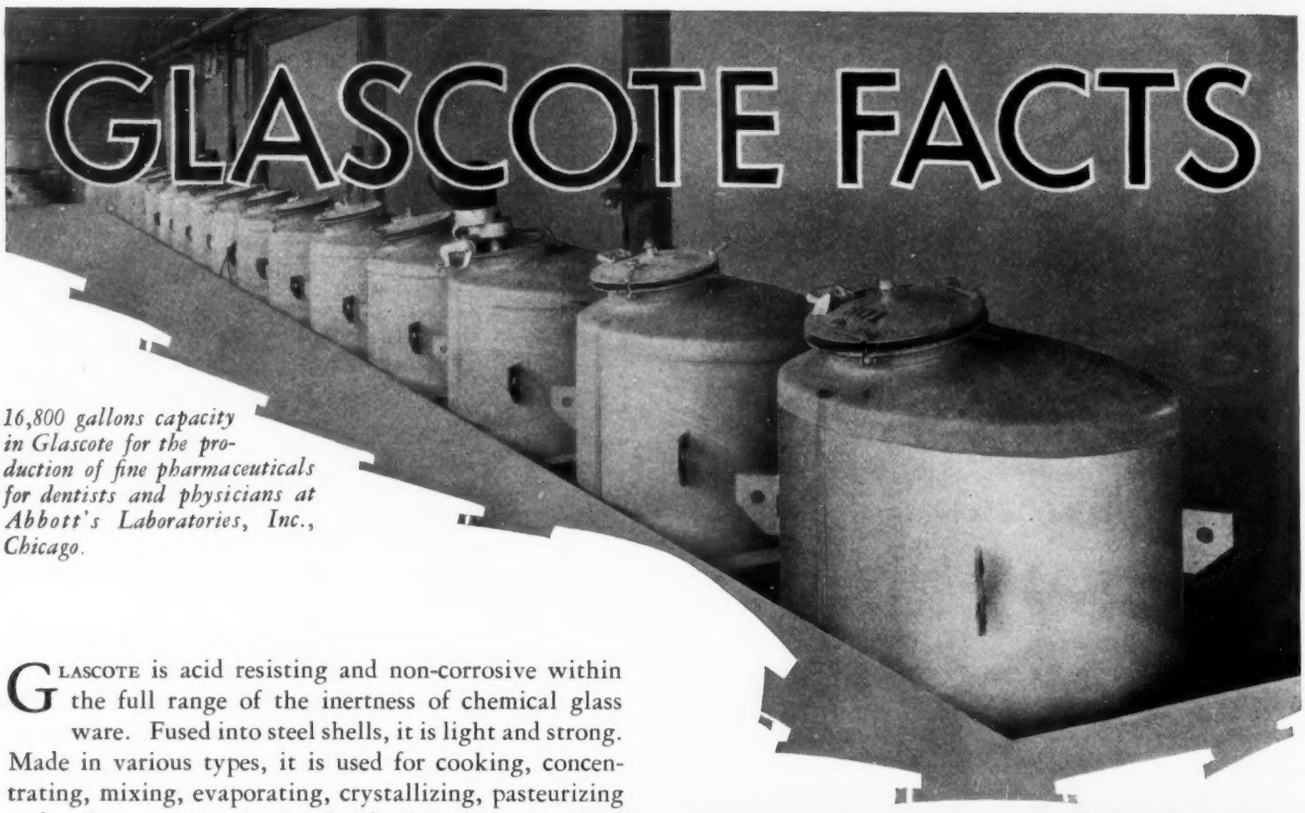

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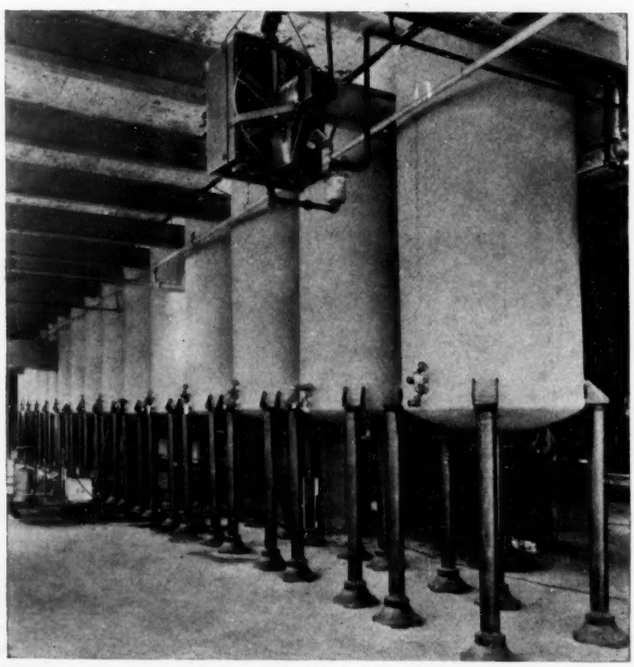

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Heading

4. (a) Heading must be No. 1 grade as generally known to the trade, of uniform thickness, and free from all defects.

(b) Heading must be thoroughly and uniformly kiln dried, properly jointed and glued, turned true to size, dressed on one side, and as follows:

Kind of Wood (group)	*Maximum Diameter (inches)*	*Maximum Head Pieces (number)*	*Minimum Thickness (inches)*
A	16	3	½
A	18	4	½
A	20	5	⅝
B	16	3	⅝
B	18	4	⅝

Hoops

5. (a) Metal hoops must be of cooperage-grade hoop steel of beaded or rolled edge type, or of coiled elm well finished and free from defects.

(b) Steel hoops must have one beaded or rolled edge, and with respect to number and size must be as follows:

Maximum:

Net weight of article shipped ..... pounds	150	300	600
Head diameter of barrel or keg ..... inches	16	17	20
Stave length of barrel or keg ..... inches	28	30	34

Minimum:

Steel hoops required ..... number ...	4	6	6
Head hoop, width ..... inches	1-¾	1-⅞	1-⅞
Quarter hoops, width ..... inches	...	1-⅜	1-⅜
Bilge hoops, width ..... inches	1-¾	1-⅞	1-⅞
Head hoops (Birmingham gage, No.)	23	22	21
Quarter hoops (Birmingham gage, No.)	...	23	23
Bilge hoops (Birmingham gage, No.)	23	23	23

(c) Wooden hoops must measure at least 9/32 inch by 5/32 inch by ⅜ inches. Ends must be joined by at least one staple and at least two additional nails or staples clinched on the inside. Number of hoops, head diameter and stave length of container must conform as follows:

Maximum:

Net weight of article shipped ..... pounds	150	300	600
Head diameter of barrel or keg ..... inches	16	17	20
Stave length of barrel or keg ..... inches	28	30	34
Elm hoops required ..... number ...	6	8	12

Minimum:

(d) All hoops must be redriven and secured in place by at least four hoop fasteners on each hoop. Fasteners must not protrude from the inside of container. Steel hoops are permitted to be secured by puncturing at four or more points.

Head Closures

6. (a) Heads in closing container must fit well into croze. Lining hoops must be used, holding heads in place, when net weight of shipment exceeds 200 pounds. These must extend entirely around the inside of chime and be nailed at intervals of about five inches. Heads must be reinforced by battens, at least 4 inches by ½ inch, nailed across grain and secured at each end by metal box strapping nailed over chime and under head hoop, for shipments of over 300 pounds net.

(b) Heads and head hoops must be secured in place by nails driven through at intervals of eight inches around hoops.

Marking

7. Each container must be plainly marked, on the head, by the manufacturer in letters and figures at least ¾ inch high, as follows:

(a) I C C—***, the stars to be replaced by specification number under which the container was made, followed by the gross weight (authorized net weight plus tare weight), for which it is authorized (for example, I C C—11A 330, ICC—11B170, etc.). This mark shall be understood to certify that the container complies with all specification requirements.

(b) Initials or symbol, located above or below marks specified in (a) of company assembling the container. This must be recorded with the Bureau of Explosives, 30 Vesey Street, New York City.

Specification 11B

1. Containers must comply with all provisions of specification 11A, except as follows: (Paragraph references are to specification 11A):

2. **Staves** are **not** required to be **tongued** and **grooved.**

3. Staves of Group B woods are also authorized for staves 24 inches or less in length, when the thickness thereof is at least 2-⅛ inches for each five staves.

4. In place of table in paragraph 4 (b), Steel hoops must conform to the following: (the only change is in the 300 pound barrel, which has four steel hoops instead of six, the two quarter hoops being omitted, and the head hoop is 21 gage instead of 22 gage. The specifications for hoops are the same as paragraph 4 (b) of 11A.)

Slack Barrels empty weigh approximately twenty pounds. Filled they carry from fifty to six hundred pounds in weight.

The concluding article of this series dealing with the tight barrel and the specifications recently adopted will appear in the March issue.

Consulting Chemists Elect

Association of Consulting Chemists and Chemical Engineers, at recent annual meeting, elected the following new officers: Allen Rogers, Pratt Institute, president; Robert Schwarz, vice-president; Alvin C. Purdy, treasurer; Paul Mahler, secretary, Irving Hochstadter, chairman, Advertising and Publicity.

Bulletins

J. T. Baker Chemical Co. has issued a booklet on "Drying Agents, A Survey and Bibliography of their properties, uses and theory."

U. S. Stoneware Co. X-Ray Bulletin No. 304 is devoted to X-ray developing tanks.

Third annual Index to A. S. T. M. Standards and Tentative Standards is issued by the American Society for Testing Materials.

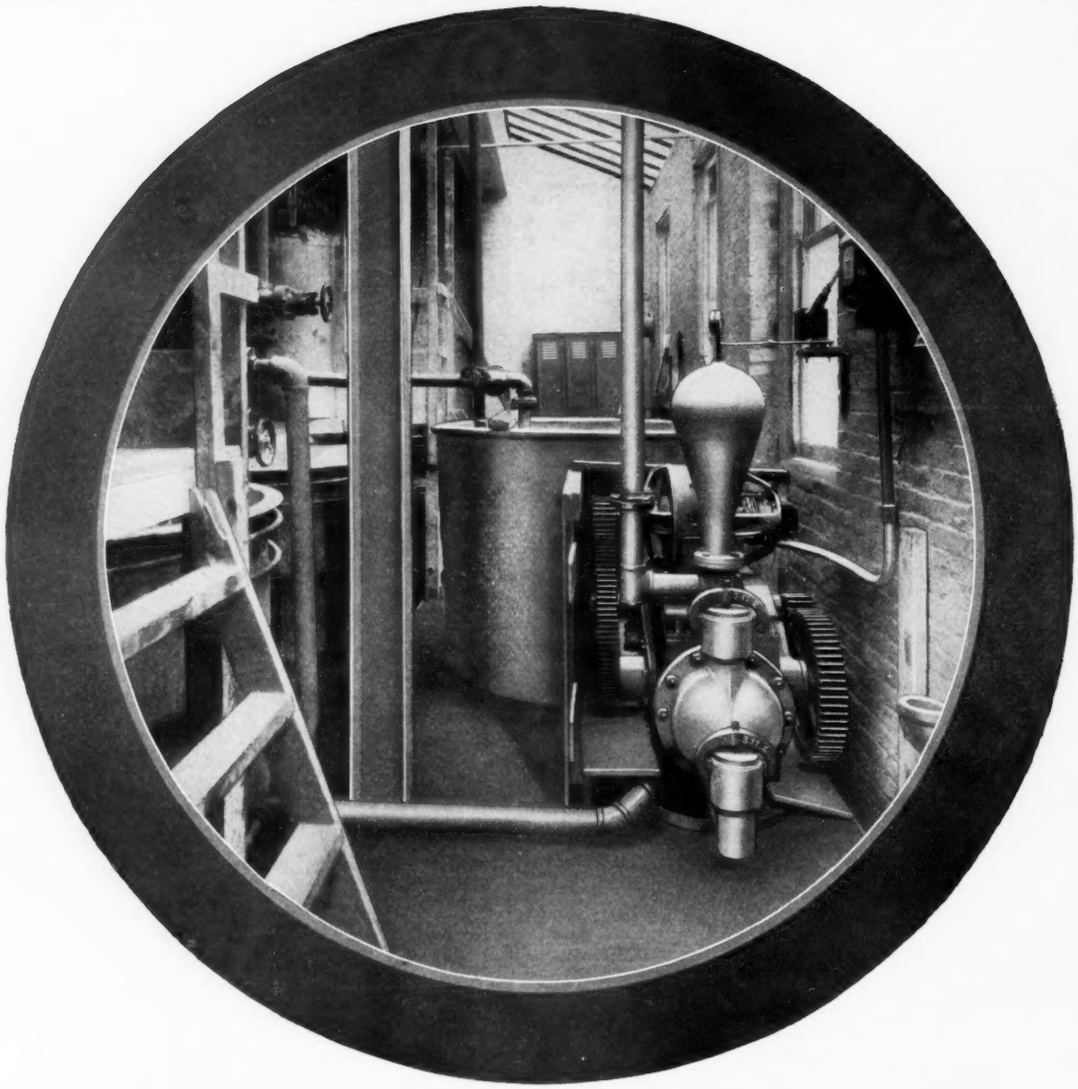
The history of The LaMotte Chemical Products Co., Baltimore, is told in a recent booklet, "The Romance of a Scientific Service."

Eastman Kodak Co. issues Organic Chemicals List No. 22.

N. V. Potash Export My., has prepared four booklets on fertilizers for distribution among buyers.

"Laboratory Reagents" is a price list of inorganic and organic chemicals, biological stains, solutions, indicators, and test papers issued by Coleman & Bell Co., Norwood, Ohio.

International Filter Co. issues bulletin on "The Chemical and Mechanical Utilization of Activated Carbon in Water Purification."



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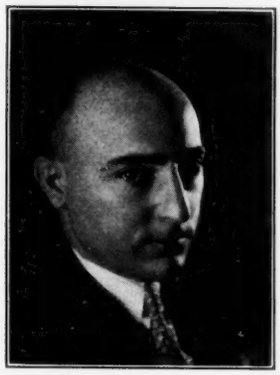


By George E. Burns

Correct Clothing for the Chemical Worker

Safety in chemical plants is largely dependent upon the intelligent use of properly designed protective clothing. The first article in a special series on the various phases of safety in the chemical industry written by a group of engineers of the National Safety Council.

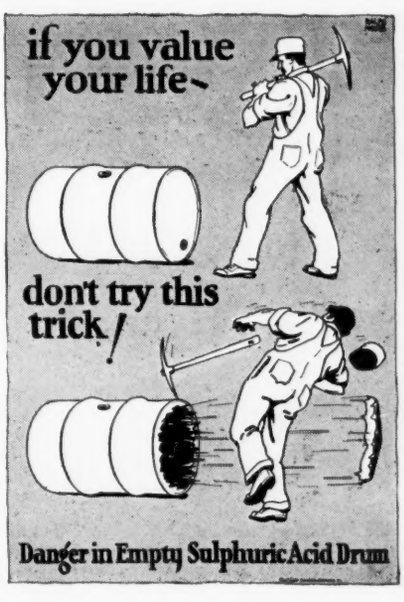
IN NO other kind of industrial work is the choice of protective clothing more important than in chemical operations. Many possible accidents and health hazards to the chemical worker are related to his clothing, due to the special conditions of the industry. First, because there are so many different kinds of chemical processes, and because these processes as a rule are closely tied up with other kinds of industrial operations. Chemical operations are subject to quick changes because of new and improved processes. These sometimes mean new hazards to the worker, though it often requires considerable scientific research to determine the exact importance of the new danger.

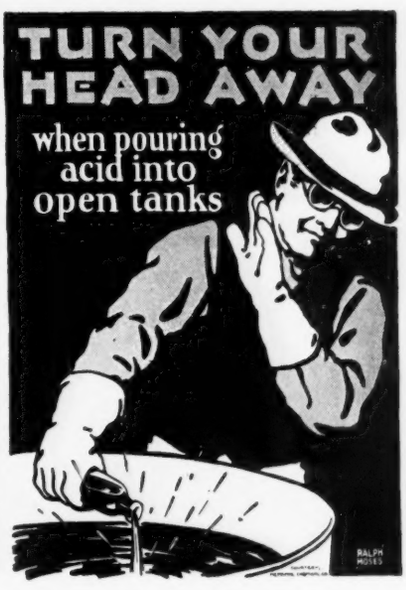
A good example of these changing hazards is the rubber industry. A committee of the Rubber Section of the National Safety Council has been at work for several years compiling a list of the different chemical compounds used in the rubber industry with analyses of these compounds from the viewpoint of health hazards. So many of these compounds are changing so steadily that work of this committee is never complete.

In a recent health practices pamphlet on "Gases and Vapors" more than one hundred chemical compounds are mentioned which may have more or less harmful effects on the health. A similar list of more than one hundred chemical substances which may become skin irritants under certain conditions has been compiled.

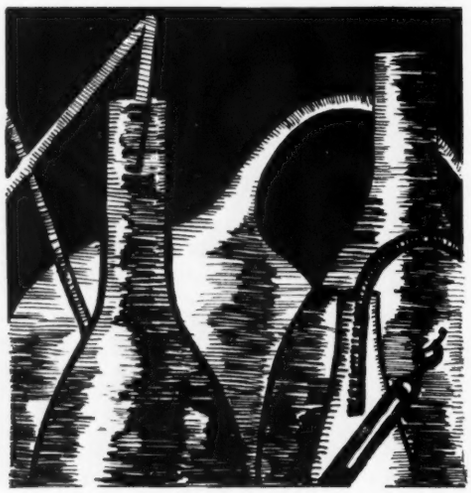
New chemical processes often utilize new chemical compounds, and these may be entirely new to industry. Such new processes usually demand special investigations, to determine the extent of the health hazards that may exist. Thus, when an organization adds new chemical processes, a special survey should be made to determine just what hazards they must guard against through protective clothing.

Chemical compounds which are causing the bulk of industrial poisonings today include compounds of lead, benzol, mercury, arsenic, hydrogen sulfide, chromium, carbon monoxide, and carbon disulfide. This list does not include some of the newer chemicals and compounds but it is fairly complete.





Corrosive acids are specially dangerous to the plant worker. National Safety Council posters stress the need of using ordinary precautions when handling acids



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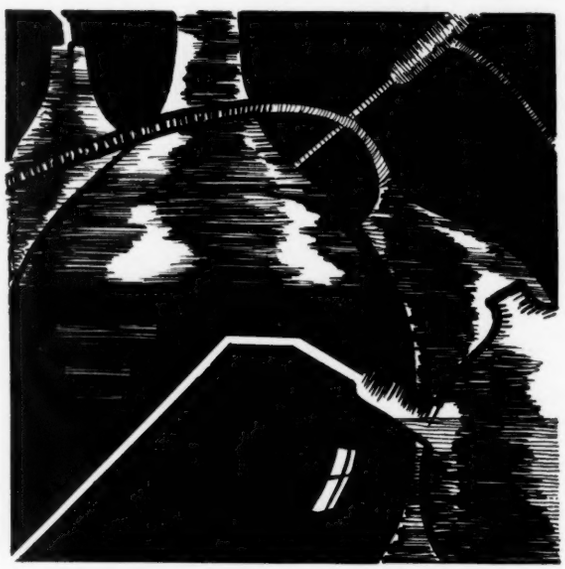

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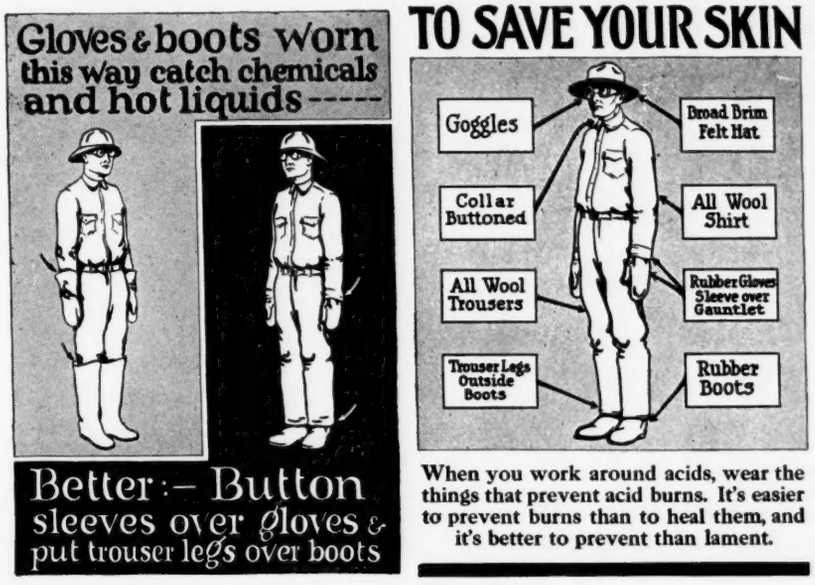
The increasing interest of all industries in the health of the workers may be partially explained because modern industry has learned that labor turnover is costly. Probably a large percentage of the labor turnover in chemical operations of all industries relate to health hazards.


Gloves & boots worn this way catch chemicals and hot liquids -----
Better :– Button sleeves over gloves & put trouser legs over boots
TO SAVE YOUR SKIN
Goggles
Broad Brim Felt Hat
Collar Buttoned
All Wool Shirt
All Wool Trousers
Rubber Gloves Sleeve over Gauntlet
Trouser Legs Outside Boots
Rubber Boots
When you work around acids, wear the things that prevent acid burns. It's easier to prevent burns than to heal them, and it's better to prevent than lament.

Safety aside from its humanitarian side pays large dividends to those concerns who have continuous safety campaigns

The exact needs in protective clothing for the chemical workers in an individual industrial plant are best determined by a thorough plant survey of all accident and health hazards. First, tabulate all plant accident statistics through a period of years. Classify the leading kinds of accidents, making a detailed study of the exact causes of the most common and the most severe accidents. From this data work out an accident prevention program, with full consideration for protective clothing.

Choosing Protective Clothing

In choosing protective clothing for the worker four essentials should be considered:

1. The garment must be reasonably comfortable in any temperature in which it must be worn.

2. The garment must fit at least fairly well, and it must not interfere with the essential movements of the worker.

3. The garment must afford adequate protection against the hazard for which it has been designed.

4. The garment must be durable.

A good general safety rule, when one is working with or around acids, is to wear a garment that will decrease the danger of acid burns. It is easier to prevent acid burns than to heal them. The best protective clothing is that which is made of or treated with rubber, or clothing made of wool. Felt hats and woolen shirts and woolen underclothing have saved many a worker from serious injuries from chemicals. Woolen clothing, however, to offer the best resistance, must be of the best grade. Cast off army clothing is popular for wear in many plants. Some employers have established the plan of furnishing woolen clothing to their employees at cost.

Correct Dress for Liquids

The worker who is best protected from general hazards from liquid chemicals will be supplied with a broad brimmed felt hat, with suitable goggles adjusted to his eyes, with an all-wool shirt with close fitting collar, and with long sleeves buttoned over the gauntlets of his rubber gloves. He will also have comfortable and well fitting rubber boots, and wool trousers with the trouser legs outside the boots.

Emphasis should be given to the fact that a hazard is created when the sleeves are inserted within the gauntlets of the rubber gloves, or when the trouser legs are inserted within the tops of the boots, since the liquids thus may be turned toward the hands or the feet rather than turned away from them.

Rubber gloves or mittens are commonly used in handling caustics, acids, alkalies, and other materials which may be injurious to the skin. For work specially rough, the rubber glove may be protected by an over-glove of leather to afford greater resistance to punctures and cuts and to provide better wearing qualities. The rubber glove should be long enough to come well over the wrist and to insert under the shirt or coat sleeve, thus leaving no gap for exposure of the wrist. Long flaring gauntlets should be avoided. The use of any kind of gloves usually is a distinct hazard around machinery, especially gloves that are heavy and that destroy the sureness of touch.

Rubber aprons are also often of value as protection in handling caustic solutions. In some operations rubber or acid-proof hoods, and hats with wire brims, are desirable to afford protection against the splashes of hot liquids or acids. Where danger exists from falling materials, as is common in some operations where there are also chemical hazards, reinforced hats or helmets are desirable to break the force of a blow or the weight of a falling object. This protective feature also may be combined with a rubber surface. For certain occupations, caps with interior padding offer protection and they may be more comfortable.

No general rule can be stated for protective clothing that is adaptable to all operations with chemical hazards. Clothing that would be considered safe in

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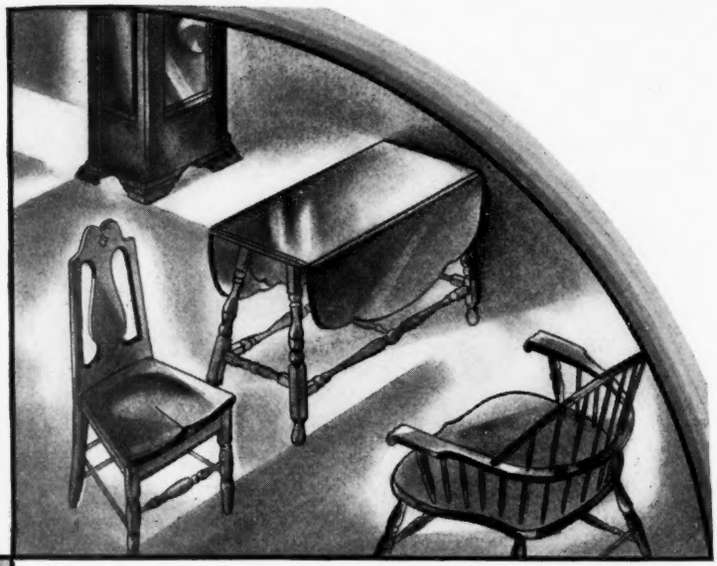

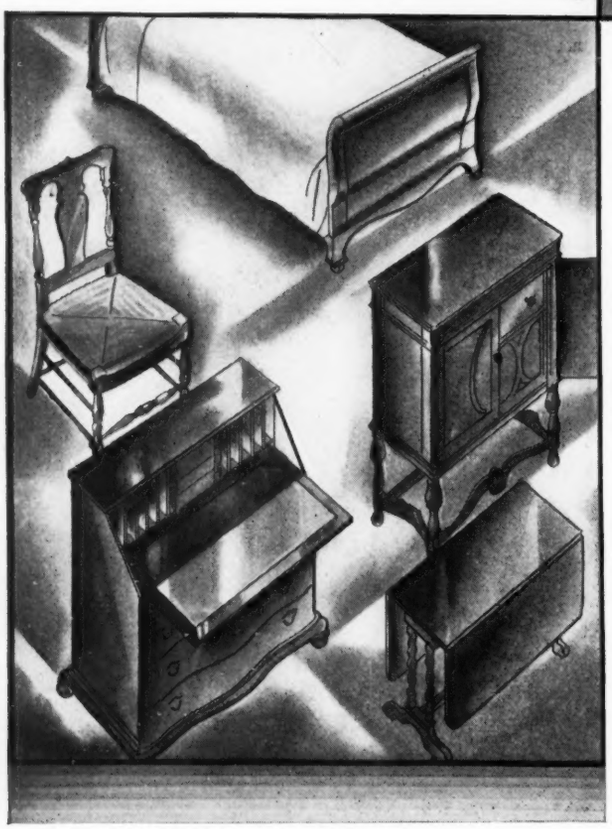

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Industrial Chemicals Division

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an area with sulfuric acid would not offer sufficient protection in a plant which was manufacturing lead oxide, nitro or amido compounds.

A large percentage of all injuries in all industries are to the feet. These injuries may be reduced through protection from different kinds of spats, shields, boots, shoes, overshoes, or special soles, depending on the especial dangers. Thousands of workers wear safety shoes which have been designed with strong protective caps and other protective features and which are neat in appearance and comfortable. Workers who must wear rubber boots are also advised to use heavy woolen socks, since they increase the comfort and do not stop circulation. Additional comfort possibly may be secured through wearing an additional pair of light weight cotton socks under the wool. In some plants it is common to wear one piece overalls which have added protective qualities as compared with a two-piece oversuit and which may be more easily cleaned.

Protective clothing in some chemical processes means first of all clean clothing. In the manufacture of aniline, should the liquid come in contact with the skin through a hole in a rubber glove or boot aniline poisoning is possible through skin absorption. A number of firms who manufacture such products do not to allow their men to work in their own clothing, but supply the necessary one-piece overalls, rubber gloves, wooden soled shoes and masks. The workmen will wear this clothing for two or three shifts then are given clean clothing; the dirty clothes are washed by the company. Such plants should provide double lockers for each man, or two sets of lockers so that his street clothing may be kept separate from his work clothing.

Several firms provide each worker with a small individual kit containing a tooth brush, tooth powder, soap and a nail brush, and a plentiful supply of face and bath towels.

Supervision Needed

At a recent National Safety Congress, the selection of the best protective devices and clothing for the employee was shown to be only half of the problem. The other half is supervision to insure that the employees properly use their protective clothing. A large part of this responsibility must be assumed by the foreman, who must develop in his workers a sense of responsibility for their own personal protection. As a rule it is not difficult to get workers in chemical operations to wear protective clothing, if they sufficiently understand the hazard. To emphasize the actual hazard, it is often a good plan to make careful demonstrations since it often is difficult for the average worker to imagine hazardous results when his experience has not given definite examples.

At another National Safety Congress a physician from a well known chemical plant discussed the value of neatness as a habit toward the elimination of health and accident hazards. "Untidiness," he stated, "which usually is the result of carelessness, is repulsive to almost everyone, but that it can be a contributory cause of accidents is many times overlooked." "Neatness," he continued, "which will of course promote greater efficiency in the worker, should be classified as one of the primary requisites of safety in the chemical laboratory. When chemicals are spilled, the 'spill' should immediately be cleaned up. If strange particles of various kinds are allowed to accumulate over a period of time, mixtures may result which will of themselves start a fire which, being communicated to scraps of paper or other waste, will spread rapidly." He also stated that this habit tended to keep the chemicals from contact with the clothing and with the skin.

Cleaning Boots and Gloves

Another problem discussed was the best method to cleanse and keep clean the rubber gloves and boots. The general policy in most plants is for each worker to have his own clothing and his own boots, and great care was exercised when these must be sterilized to see that they get back to their rightful owners.

Two most important hazards in chemical operations are possible dangers to the eyes and skin affections including burns. The best first-aid treatment for acid burns is immediate flushing with running water. The patient then should receive immediate medical attention. To provide immediate flushing, most plants are equipped with running water in convenient form and at convenient places.

The first step for the prevention and treatment of skin diseases in the chemical industry is prompt detection. For the best results, close attention must be made by competent inspectors and frequent examination of the workers through first-aid headquarters or by the plant physician. Each case of suspected skin affection requires especial analysis and special treatment for best results.

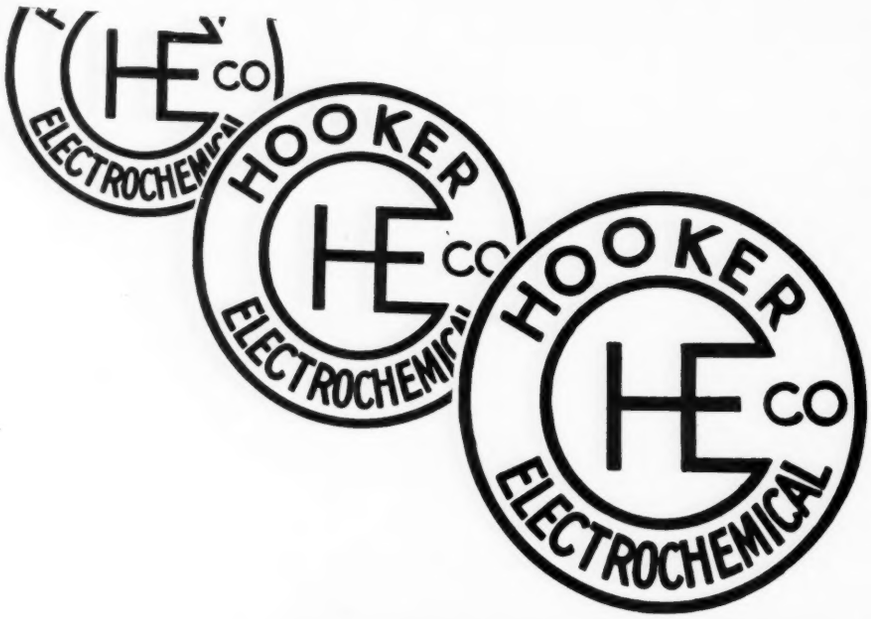
Proper Checking of Hazards

Use of the best protective clothing calls for careful consideration, and the following program includes the essential steps for a proper checking of the chemical health hazards of a plant:

1. A complete study, from the viewpoint of accident and health hazards, of the processes of the plant.

2. A careful study of each employee at the time of employment, to determine the degree of his individual susceptibility to the hazards of the processes with which he will be concerned. This necessitates an initial physical examination.

3. A continuous study of the adaptation of each worker to the health hazards of his own work, which demands frequent plant inspections and periodic physical examinations.



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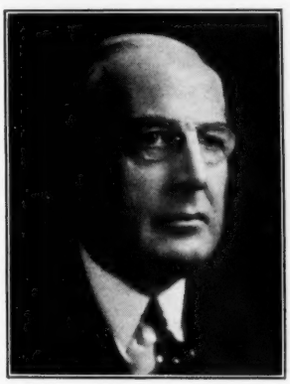
5027

Chemical Facts and Figures

Fertilizer Profits—Open Trading in Molasses—Wood Alcohol Regulation—Capper-Kelly Bill Passed by House—Swann Acquires Wilckes, Martin, Wilckes

The fertilizer situation occupied a very prominent place in the chemical news of the month. Declaring that the average American banker feels that fertilizer is all right for the farmer to buy when conditions are good, but one of those things that can be cut out from requirements when conditions are bad, Horace Bowker, president of the American Agricultural Chemical Company, drew attention to the present conditions affecting the fertilizer industry in an open letter sent to every bank president east of the Rocky Mountains asking him not to lay down the general rule, "No loans for fertilizer." He also submitted statistics to show that by "the adequate use of fertilizer to produce maximum yields for every acre which is farmed, it is possible to grow crops at a sufficiently low cost per bushel to enable the farmer to show a profit at present farm prices."



Horace Bowker

Mr. Bowker said reports from district managers of his company had led him to believe that the average American banker had the attitude that fertilizer was something to be curtailed when there was need for lowering farm expenses. He added that a desire to show any banker who might hold that attitude how "penny-wise, pound-foolish" it was, had prompted the letter.

Fertilizer Profits

The average farmer's and layman's viewpoint on fertilizers continually stresses the "enormous" profits to be derived from their manufacture and sale. To offset this propaganda Charles J. Brand, executive secretary of the National Fertilizer Association, prepared an exhaustive investigation and the result of his labor was broadcast not only in the trade papers of the industry, but also in the newspapers of the country.

To quote from his report, "During 1930 the fertilizer industry earned only about 3.8 per cent on its net investment.

"In 1929 its average earnings, based on net worth, were only 4 per cent," Mr. Brand added, and while figures for 1928 are lacking, he states that the industry lost between $20,000,000 and $22,000,000 in 1927. "This clearly shows that fertilizers are reasonably priced, when costs of production and distribution are considered.

"In comparison, the motor industry in 1929 earned 23.5 per cent on its net worth; the agricultural implement industry, 13.4 per cent; the petroleum industry, 11.1 per cent, and the fertilizer industry, 4 per cent.

"Such fertilizer materials as declined in price during the last twelve months saw their largest reductions in the late fall. Many manufacturers had already purchased their materials at higher prices, and had begun processing them for the spring season.

"At the middle of December our index of 476 commodity prices showed that during the last twelve months prices of complete fertilizer had declined approximately 7 per cent, while prices of fertilizer materials had declined 10½ per cent.

An Unsettling Influence

Added to the adverse conditions affecting the fertilizer industry caused by the plight of the farmer in many sections of the country and poor industrial business conditions generally, is the vexing Muscle Shoals question. While this situation is described more in detail in the Washington News Section it is sufficient to say that the fertilizer industry is seriously handicapped in laying out any broad constructive policy while the uncertainty over the government's attitude on operation continues.

Production Figures

A decrease of 27.4 per cent in the amount of sulfate of ammonia produced in November as compared with the same month in 1929 is indicated by the recent U. S. Bureau of Mines report covering by-product coke production in the United States. For the first eleven months of 1930 the decline in coke production indicated a 13.9 per cent decrease from the amount of by-product sulfate recovered in the same period of 1929.

In the light of the above statistics showing a very decided drop in the production of ammonium sulfate caused by the very low rate of operation in the steel industry, the figures on phosphate shipments furnish an interesting contrast and indicate the increasingly important position of this country in phosphate production.

Shipments of phosphate through Tampa elevators established a new high record in 1930 with a total of 1,841,400 tons dispatched to foreign and coastal ports.

The total of phosphate shipments from this port in 1930 is 154,000 tons greater than the record aggregate of 1929, and is 339,000 tons in excess of the amount shipped in 1928, which was a record up to that time.

Radio Advertising

That the fertilizer industry is keenly alive to the necessity of employing every possible means of sales promotion is evidenced by the announcement of the Barrett Co. of a new radio feature advertising sulfate of ammonia.

Swift & Co. has joined the procession with a novel radio broadcast and rumor has it that several of the other large fertilizer companies are seriously considering the radio in an effort to promote sales.

Blackstrap Futures

New York Coffee and Sugar Exchange opened trading in blackstrap futures on February 2.

Benjamin B. Peabody, president of the Exchange, commenting on this move, said:

"Following careful consideration and investigation of the subject by a special committee, we were led to believe that the admission of blackstrap molasses to open trading would meet with considerable favor, especially among sellers and buyers in that trade. There is no futures market for this commodity in the world, and it is necessary for the producer to sell and for the distributor to buy blackstrap molasses in bulk approximately one year ahead of its ultimate production, both parties thus standing the risk of fluctuation in price and date of delivery."

Rayon Prices

As the rayon industry is one of the largest consumers of industrial raw chemicals, changes in rayon prices are of interest to chemical manufacturers. Rayon yarn prices fell to new low levels with the announcement on January 8 by the Viscose Co., largest American producer, of reductions ranging from 15c to 35c per pound.

Washington

Congressman Fred A. Britten (Rep.) of Chicago introduced on January 19, a bill to regulate the interstate transportation of wood alcohol making it a misdemeanor punishable by fine not to exceed five hundred dollars or a jail sentence not to exceed one year or both, for any person to transport in interstate commerce wood alcohol, methanol, or methyl alcohol whether derived from the destructive distillation of wood, synthesis of gases or other processes unless the package containing same shall bear a label showing red skull and crossbones and the words "Deadly Poison—Wood Alcohol" together with the words "WARNING: Wood Alcohol (methanol or methyl alcohol) is extremely poisonous and may cause blindness or death if it enters the body through the mouth, by skin absorption, or by inhalation of vapors."

"The great number of deaths resulting from poisonous alcohol last year makes it obligatory upon the Federal Government to place every possible safeguard and protection around the sales and transportation of wood alcohol or methanol," said Congressman Fred A. Britten.

Alcohol Regulations

Alcohol continues to occupy a prominent place in the Washington news. The new joint regulations for the regulation of the legitimate alcohol and liquor traffic probably will not be issued by the Treasury and Justice departments until March 1. They were to have been placed in effect originally on the first of the year, then February 1, but the tenative date is now March 1. It is understood that several modifications have been made in the first draft which contained several objectionable features. It is necessary that every one connected with the manufacture or sale of industrial alcohol should be thoroughly conversant with the new regulations.

Muscle Shoals

Senate and House conferees appeared to be no nearer any common agreement on the Muscle Shoals question as the month closed despite several additional conferences. After a tentative agreement on the 7th, the members of the committee met again on the 13th, and this meeting finally broke up in further disagreement when Senator Norris walked out of the conference. The main point of disagreement appears to be whether the nitrate plant should be used for making fertilizer, which is the strong contention of the Senate conferees, or whether as the House members think, it should be used for making fertilizer to a certain point of the plant's capacity and then to make nitrogen chemicals.

Representative Garner of Texas, House minority leader, on January 17, introduced a resolution to discharge the House conferees and appoint new ones. The resolution was referred to the Committee on Rules. The Associated Press, in commenting on Garner's action, said that "a Democratic move is under way to have the House conference committee discharged. Little success is expected at this time unless Republicans are assured that the President would decline to approve the Norris plan. In that event the government operation proposal might be disposed of in Congress to be vetoed by the President."

Amend Explosive Ruling

Interstate Commerce Commission has announced a hearing to be held before Director W. P. Bartel at Washington on February 10 to consider changes or modifications in the regulations governing transportation of explosives and other dangerous articles by freight, express, or baggage services.

Among changes contemplated is one excepting liquid road asphalt from the requirement that it be piped from tank cars to permanent storage. Another would add sulfuric acid sludge to the items for which special packing is required. A proposed addition to Paragraph 429 is designed to provide for employment of a second method for determining the weight of liquefied gas changed into a tank car for transportation.

Capper-Kelly Bill

The Capper-Kelly Honest Merchandising Bill, pending in Congress in one form or another for more than 15 years, was passed by the House of Representatives on January 29 with several amendments two of which are unsatisfactory to the friends of the bill; however, conferences between the managers of the measure and Senator Capper, co-author of the bill, have resulted in a decision to accept the measure in the form in which it was passed in the House. This will result in the establishment of the principle of the protection of resale prices and any defects in the proposed law may be cured by future legislation. This program will obviate the necessity of returning the bill to the House for a conference concerning the changes that might be made by the Senate.

New Swann Acquisition

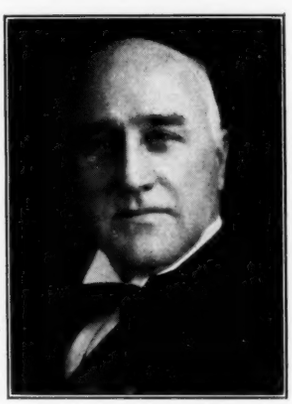
Theodore Swann announced on Februare 2 that Wilckes, Martin, Wilckes Co., manufacturers of lamp blacks and phosphates, had become a division of The Swann Corp. Besides adding lamp black to the line of Swann products, the Wilckes, Martin, Wilckes phosphate plant at Camden, New Jersey, provides the Swann group of chemical companies with a chemical producing point in the eastern territory.

Theodore Swann

The New York office of Wilckes, Martin, Wilckes will be moved about March 1 from 135 William Street to the Graybar Building, and will be consolidated with the Swann offices now located there.

Ferdinand Wilckes, formerly president of Wilckes, Martin, Wilckes Company, has been named to the Board of The Swann Corp. The new Board of Directors of Wilckes, Martin, Wilckes is composed of Theodore Swann, Luther Martin III, Edward Van Berlo, C. M. Jesperson and John A.Chew.

In an announcement to the lamp black and chemical trade, Mr. Martin, Chairman of the Board, says:



Luther Martin III

"We have long recognized that outstanding achievements in applied chemistry are coming from the research and development organization of The Swann Corporation. Swann Research has a series of major accomplishments to its credit, which fit very closely into the materials

we produce, and which have already helped us to raise very decidedly the level of our service. So we have concluded an arrangement by which we have become a division of The Swann Corporation."

Luther Martin III, Chairman of the Board, and Luther Martin IV, Secretary, are the third and fourth generations of lamp black manufacturers, the first Luther Martin having begun the manufacture of lamp black at Tacony, Pennsylvania, in 1849.

Freeport Buys Rights

Freeport Texas Co. has purchased sulfur rights to a property known as the Vinton dome, which has a cap-rock area of approximately 750 acres, located at Vinton, Calcasieu Parish, La., 12 miles southwest of the Union Sulphur Co.'s original sulfur dome at Sulphur, La.

The Vinton dome is reported by geologists to be one of the most promising areas for potential sulfur deposits, and has been sought after for years by the leading sulfur interests but heretofore has been unavailable because closely held by an estate. It is favorably located for sulfur operations, three miles from the main line of the Southern Pacific R. R. and five miles from the inter-coastal canal leading from Orange, Texas to the Gulf of Mexico. High tension electric and natural gas lines pass close by. Equipment is being moved to the properties and exploration drilling will be started in two weeks.

Copper Tariff

The proposal of a 2 cent tariff on copper introduced in a bill placed before the House by Representative Evans, (Montana) has met with strenuous opposition from both producers and custom smelters. It was said that none of the large, low cost producers in this country want a tariff, and that the industry is much better off if allowed to work out its own problems without the artificial aid of a tariff.

It was further pointed out that two of the largest American companies have cheap copper production in Chile, and would have to pay duty on all copper they imported into the United States, although the Chilean companies are controlled by American capital, it was pointed out.

It was felt in some quarters that those who have urged the adoption of the tariff have not studied the situation more closely than the use of export and import statistics would permit, and that the adoption of the tariff would have more far-reaching results than a mere lessening of the copper imported here.

Representative Evans was quoted as saying in support of the measure, "Copper miners in the West can no more compete with this cheap foreign labor of foreign countries in the mining of copper," he declared, "than can labor in the manufacturing districts compete with factory workers in cheap labor countries.

Personnel

U. S. I. Head Resigns

Russell R. Brown announced on January 9 his resignation as president of the U. S. Industrial Alcohol Co., to take effect at the next annual meeting of the stockholders April 16, 1931.

Russell R. Brown

Neither Mr. Brown nor officials of the company have indicated the reason for the resignation at this time nor has Mr. Brown divulged his future plans.

C. E. Adams, chairman of the board of the company, has advised that as yet no action has been taken by the directors looking toward the election of Mr. Brown's successor.

C. H. Penning, formerly with the Swann Chemical Co., has joined the staff of the Tennessee Eastman Corporation, Kingsport, Tenn. He will be concerned primarily with sales development and engineering service on cellulose acetate in all forms.

J. Heath Wood has been elected president at the annual meeting of the board of directors of the Standard Varnish Works. Mr. Wood has been a vice president and director of the company, in charge of the Middle Western business, for a number of years.

Wood Chemical Products Co. has elected W. J. O'Brien and T. E. Borton to the directorate succeeding E. S. Wallace and M. F. Emrich. Other directors reelected.

John A. Stephens has resigned as president and director of the Celluloid Corporation.

E. W. Beatty, president of the Canadian Pacific Railway Company and chairman of its board of directors, has been elected a director of the International Nickel Company of Canada. He takes the place of the late Lord Melchett.

Dr. Edward R. Weidlein, director of Mellon Institute of Industrial Research, Pittsburgh, Pa., has announced the appointment of Dr. Leonard Harrison Cretcher to an assistant directorship in the institution. Dr. Cretcher, who, since 1926, has been serving as head of the Institute's Department of Research in Pure Chemistry, is a specialist in organic chemistry and will have supervisory charge of a group of industrial fellowships that are concerned with problems in organo-chemical technology. In addition to serving in this positional capacity, Dr. Cretcher will continue as directional head of the Department of Research in Pure Chemistry. In this work he will be aided by Dr. William L. Nelson.

Dr. Lawrence Wade Bass, who, for two years, has been a member of the Executive Staff of Mellon Institute of Industrial Research, Pittsburgh, Pa., has resigned, effective February 1, to accept the post of Assistant Director of Research of the Borden Company, New York, N. Y.

Robert R. M. Carpenter, Vice-President of E. I. du Pont de Nemours & Co., Philadelphia, has been made a director of the Girard Trust Co. of Philadelphia, succeeding Arthur W. Thompson, deceased.

Judge George W. Olvany has been added to the list of directors of Delaware Rayon Co. at the regular annual meeting of the stockholders of the company.

Equipment Companies

Clifford F. Messinger, formerly vice-president and general manager of the Chain Belt Co., was elected president at the December meeting of the Board of Directors, succeeding his brother C. R. Messinger, who resigned to become president of the Oliver Farm Equipment Company, January 1.

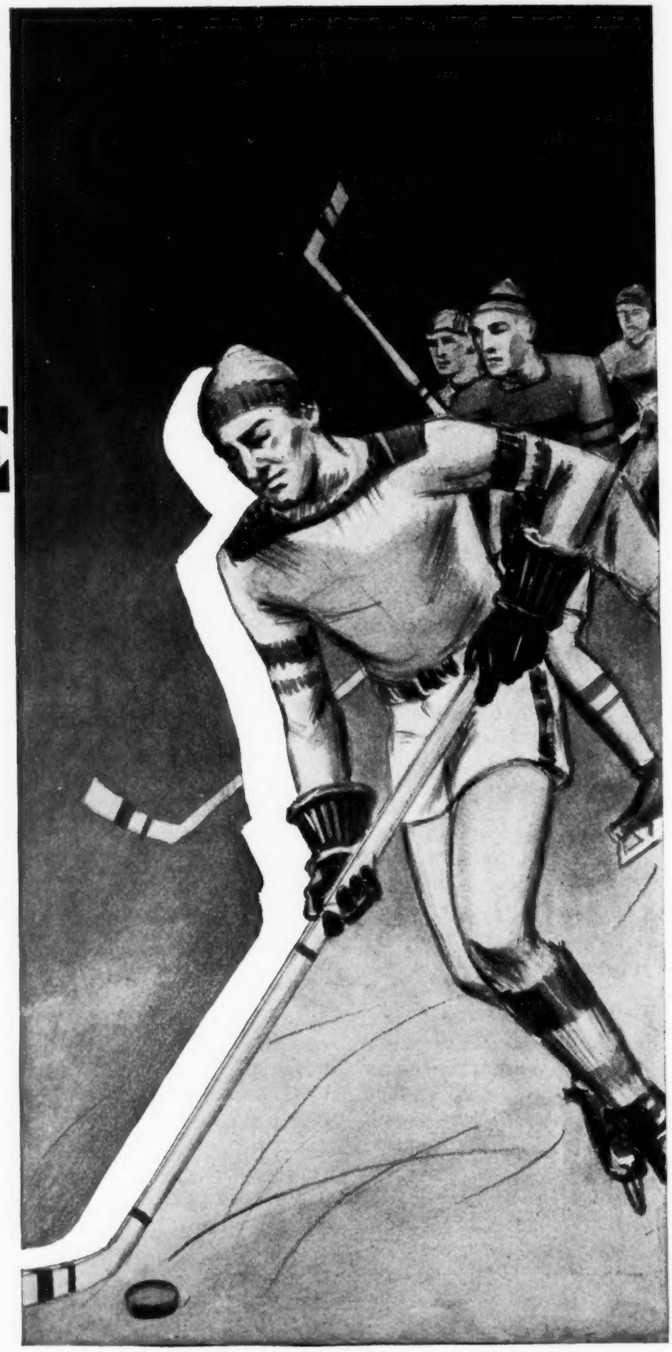
D. H. Jackson, formerly in charge of advertising and information work on "Industrial and Engineering Chemistry" for the Chemical Catalog Company, this city, has become sales manager for the Croll-Reynolds Engineering Company, manufacturer of power plant and chemical engineering equipment, 17 John street, this city.

W. H. Carrier has been elected chairman of the board of Carrier Corp., a holding company formed to acquire the Carrier Engineering Corp., Brunswick-Kroeschell Co. and York Heating & Ventilating Co.

New Inhibitors

Grasselli Chemical Co. has announced the development of two inhibitors that insure greater acid pickling efficiency. Both grades have similar inhibiting properties but No. 2 produces a foam blanket on the surface of the pickling solution which acts as a filter and condenser for any gas or vapors that might develop.

THE EXTRA ADVANTAGE



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EBG

Liquid Chlorine

News of the Companies

Hercules Powder Co. announced the appointment of Loos & Dilworth, Inc., Philadelphia, as distributors of Hercules Naval Stores.

American Agricultural Chemical Co. has purchased several acres of river front land in St. Paul and is opening a northwest sales and distributing headquarters immediately and plans to erect a chemical fertilizer factory here.

Property on the Mississippi River was obtained so that the company can bring phosphate rock up the river by barge line from its Florida phosphate mines.

United Carbon has signed a long term contract with the Warfield Natural Gas Company, subsidiary of the Columbia Gas and Electric Corporation, whereby the Warfield company will purchase all natural gas to be produced on the lands and leases held by the United Company in eastern Kentucky.

Archer-Daniels-Midland Co. will reopen its Edgewater, N. J., plant before February 15. It will operate on Argentina flaxseed, and a sufficient supply has been arranged for to keep the plant going for some time.

The Tennessee Corp. expansion program (Tennessee Copper & Chemical Co.) in East Tennessee, is reported to be progressing rapidly. This company is spending approximately $2,000,000 for extensions, and the program is planned for completion this year.

Du Pont has just announced Pontamine Fast Blue RR, a direct dyestuff yielding brilliant reddish blue shades of excellent light fastness.

The Glyco Products Co., Inc. has recently introduced three specialties;

Foramapin—A non-toxic paste producing froth or foam in aqueous products which resemble saponin in its results but is free from the latter's poisonous properties. It dissolves readily in cold water.

Bead Oil—used to advantage to produce a foam in alcoholic products such as hair-tonics, beverages, etc. It also is non-toxic.

No-Foam is indicated in manufacturing processes where excessive foam formation is undesirable. The addition of a small amount of No-Foam cuts down foam and froth tremendously because it increases surface tension.

Interstate Chemical Manufacturing Co. has been formed by William H. Rose, H. B. Van Cleve, and Clarence Miller, and has purchased the assets of the Interstate Chemical Co. The new company, which is capitalized with 1,500 shares of no-par stock, will continue the manufacture of arsenates and other agricultural insecticides and fungicides in the plant of its predecessor in Jersey City.

Continental Chemical Corp., manufacturer of varnishes and floor-dressings, will move its headquarters from Watseka, Ill., to Brazil, Ind., early in the Spring. A three-story, $75,000 plant is being erected in Brazil.

Work is progressing rapidly on reconstruction of the Everett plant of the Merrimac Chemical, the New England subsidiary of Monsanto which was destroyed by fire last March. It is scheduled to be ready for occupancy by October 1 next.

Operations now concentrated at the Woburn plant will be transferred to Everett. It is planned eventually to dispose of the Woburn unit.

Sherwin-Williams has abolished the stagger system and resumption of full production with 5,400 workers on regular time.

The stagger plan has been used since last fall by 700 employes, who will be placed back on regular time.

The Peerless-Union Explosives Corp., a Delaware corporation, principal office in Virginia at Bluefields, with T. B. Nunan agent in charge of business and with maximum capital $5,000,000 preferred and 100,000 shares of common stock without par value, has been granted a certificate of authority to manufacture and deal in explosives.

Hercules Powder is completing a new experimental laboratory, costing more than $500,000 which will house the research facilities. The main laboratory building and a number of smaller units have been finished and are awaiting installation of equipment.

The new location near Wilmington represents a closer contact of the company's research department and its main office, the laboratories being moved here from Kenvil, N. J.

Monsanto St. Louis plant wins safety trophy for last quarter of 1930 although the men at Plant "B" in Monsanto, Ill., continued their unbroken record, they were compelled to surrender the Safety Trophy to Plant "A" because of Plant "A's" perfect score for the quarter with a greater number of man-hours worked. Both plants are to be congratulated on their remarkable record.

Equipment Companies

Union Carbide & Carbon units whose products are used in the main for oxy-acetylene welding and cutting are now marketing their products through the Linde Air Products Co. It is now possible to secure all welding equipment and supplies through this one company.

International Combustion interests, since their negotiations with the Foster Wheeler Company failed, have been trying to interest other large manufacturers, including the Baldwin Locomotive Works.

General Electric is planning to build a $4,000,000 power plant at its works at Schenectady. Included will be the largest mercury vapor turbine ever built, with a capacity of 26,700 horsepower.

The Duriron Co., manufacturers of acid-proof metals, have their new steel foundry in full operation producing chrome-nickel and chrome-nickel-silicon alloy steels which they are adding to their line.

A factory branch office of the Company was opened February first at 7-252 General Motors Building, Detroit. Richard R. Rourke, former sales engineer out of the general office has been appointed manager.

The Lummus Company, a new engineering and contracting firm having authorized capital stock of ten million dollars, has been organized to take over the business of the Walter E. Lummus Company of Boston, Mass. The Superheater Company and The Babcock & Wilcox Company hold substantial blocks in the new firm.

Rockefeller Oil Holdings

Rockefellers announce disposal of holdings in several oil and affiliated companies concentrating on a few of the original pioneers.

The companies from which the Rockefeller interests are said to have withdrawn entirely are the Standard Oil Co. of Kentucky, the Standard Oil Co. of Kansas, the Atlantic Refining Co., the Prairie Oil & Gas Co., and the Prairie Pipe Line Co. The enterprises in which they have largely centered their interest are the Standard

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Oil Co. of N. J., the Standard Oil Co. of N. Y., the Standard Oil Co. of Ind., the Standard Oil Co. of Cal. and Vacuum Oil.

Standard Oil Co., of New Jersey employee stock holders numbered 26,380 at the end of last October, a gain of 2,838 since Jan. 1, it is reported in The Lamp, official organ of the company.

"The price at which subscribers to the stock plan acquired shares of the Standard Oil Company of New Jersey was established for the last half of 1930 on the basis of the average price of all transactions in this issue reported on the New York Stock Exchange in April, May and June," the article continues.

Atlas Powder Co. expansion program is indicated in the approval by the New York Stock Exchange of an application by the company for the listing of an additional 2,291 shares of 6 per cent preferred stock. This new stock is to be used as part consideration in the purchase by the Atlas company of the assets and business of the Puget Sound & Alaska Powder Co.

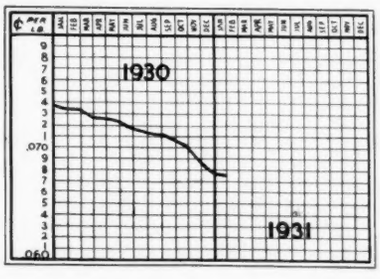
U. S. Potash Surveys

Geological Survey announced completed analyses of cores from the seventeenth and eighteenth government potash test holes drilled in Lea County, New Mexico, and Loving County, Texas. Each hole shows presence of beds containing carnallite and sylvite, two of the commercially most important potash minerals in the European fields, according to the survey. The holes also revealed numerous beds of polyhalite.

Probably none of the beds encountered has sufficient richness to become of immediate commercial interest, but several beds in hole 17 are possibly of prospective importance.

Industrial Chemical Prices

The CHEMICAL MARKETS average price index of industrial chemicals, based on fifteen representative products again showed a reduction in January over December, the ninth consecutive decline, the December figure being .0679c and the January figure .0676c.



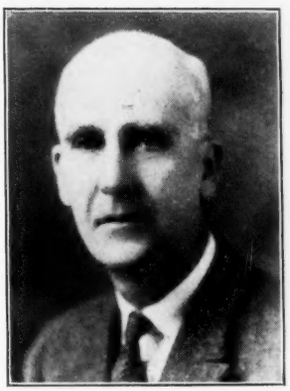
The single bright spot in the picture was a gradual resumption of operations in many of the industries that are large consumers of chemicals. The volume of shipments was decidedly better in January with the period of inventory out of the way.

Nitrate Conferences

Considerable secrecy continues to surround the negotiations quietly going on in New York between prominent international banking interests and the representatives of the new Chilean nitrate combine, "Cosach". No details were forthcoming except a general statement that the negotiations were progressing satisfactorily and that the delegates were practically in accord with the financial and Guggenheim interests as to the details of the agreement. What further financing is to be undertaken is still to be determined.

Obituaries

Dr. Richard Bishop Moore, well known chemist and first scientist to isolate radium and helium in the United States, died January 21, aged 59. Dr. Moore was born in Cincinnati, Ohio, and received most of his education in England, where he first



Dr. Richard C. Moore

began his career, as a teacher. He later came to the United States and taught chemistry first at the University of Missouri, then at Butler College, where he remained until 1911. In that year he was appointed assistant chief of the Division of Chemical and Physical Investigations in the Bureau of Soils, Department of Agriculture. He became interested in the development of radio-active ores and was detailed to establish a rare metals experiment station in Denver. He worked out a technique for the extraction of radium and raised funds for founding the National Radium Institute. He was also the originator of the use of helium in airplanes. In 1923 he left the government service and became associated with the Dorr Company, Inc. Later he went to Purdue University, where he was dean of science and head consulting engineer of the department of chemistry at the time of his death. Dr. Moore had been awarded the William Longstreth, Howard Potts and Perkin medals. He belonged to the American Chemical Society, the American Electro-Chemical Society, the Division of Chemistry and Engineering of the National Research Council, and many other organizations.

Adolph Hirsh, head of Adolph Hirsh & Son, manufacturer and importer of chemicals, starches, sizes and allied products, and director of a number of corporations, including the National Fertilizer and Chemical Co., the Hygenic Chemical Co. and American Process Co., died January 23, aged 80.

Captain Isaac Edward Emerson, president Citro Chemical Works of America and chairman, American Bromine Co., died January 23, aged 71. Nearly 50 years ago, as a young chemist, he worked out and patented a formula for a headache powder, from the sale of which he accumulated his large fortune.

Stanley Doggett, president of Stanley Doggett, Inc., died December 29th, aged 60.

John Bosworth Lewis, head of John D. Lewis, Providence and Boston, importers and manufacturers of dyestuffs and chemicals, died December 29, aged 56.

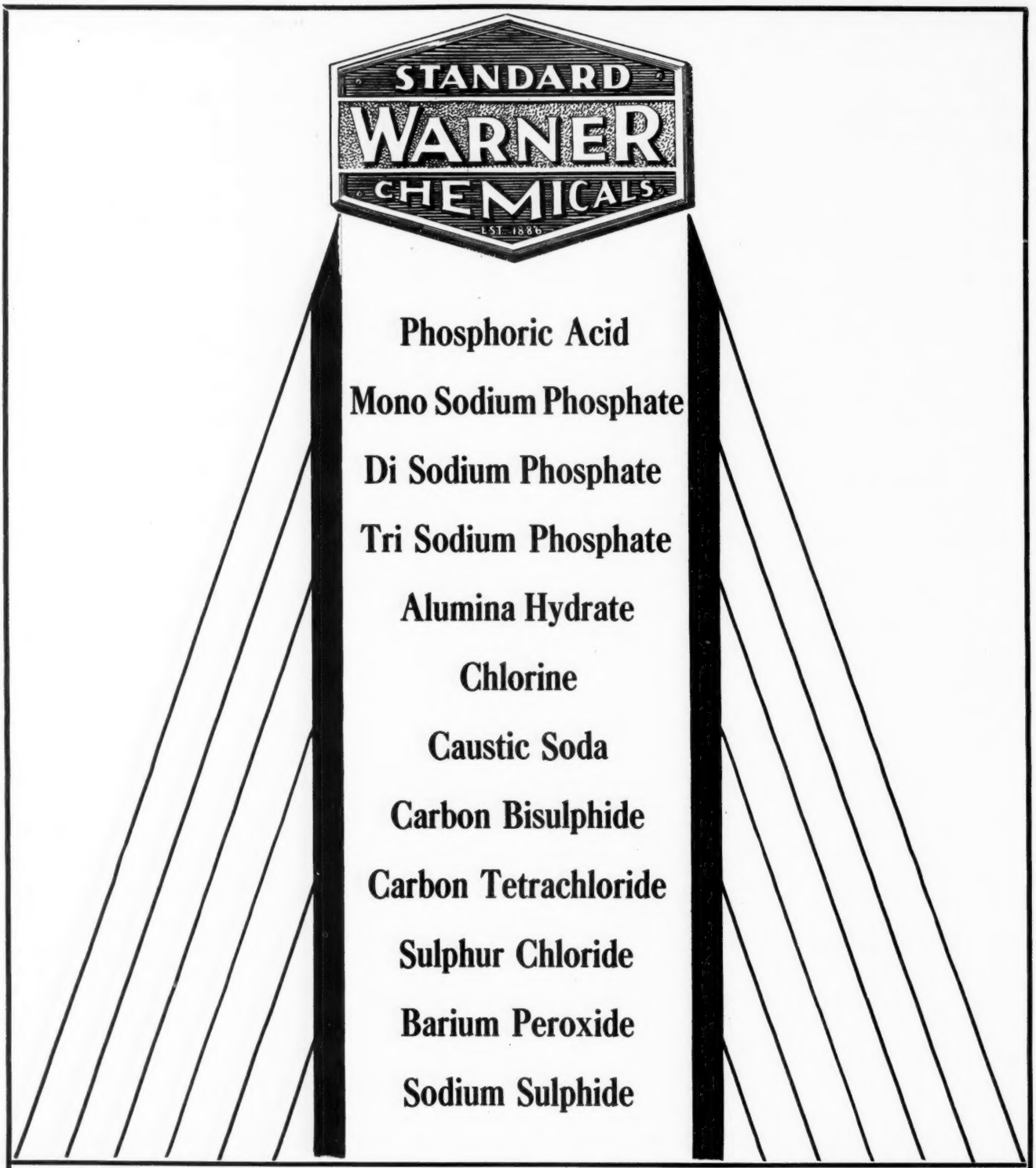
Wasserscheid Promoted

A. A. Wasserscheid, manager, Eastern division, Mallinckrodt Chemical Works since 1913, has been elected vice president of the company, with which he has been connected since 1893, when he joined the sales force. Before that he had been with J. Jungmann for three years. He was born January 15, 1871, and educated in the public schools of New York and the College of the City of New York. He is a member of the Salesmen's Association of the Chemical Industry and of several social organizations.

Thomas C. Gregory is now with the American Agricultural Chemical Co. in charge of the commercial research division. Mr. Gregory for the past three years has been a consulting chemical economist to several of the large chemical companies and previously acted in a similar capacity for the Chemical Catalog Co.

Wishnick-Tumpeer, Inc., has announced the opening of a Cleveland office, at 523 Guardian Building, Telephone—Cherry 0583 and 0584—in charge of Mr. Julius Tumpeer, Vice-President.

The dyestuffs department of E. I. du Pont de Nemours & Co. has been moved from 8 to 61 Thomas street, the Merchants Square Building, New York.



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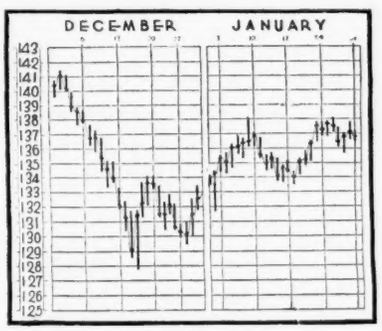
The Financial Markets

Stocks Show Gradual Rise—Chemical Stocks React on Price Reductions—General Public Interest in Chemical Stocks Grows.

In general, the past month was one of modest recovery from the extremely low levels prevailing during December. While the general movement of the leading stocks was erratic, reflecting the sensitive condition of the market, the net result, in most instances, was a gain. If the trend of the



*Current Market Trend**

market is a barometer in the present depression, as it has been in similar conditions in the past, the unmistakable signs point to improvement in the business situation. A note of optimism has been heard here and there. Whether it will be sustained remains to be seen, but in most quarters the sentiment since January 1, has been decidedly bullish in the face of several discouraging angles to the situation.

Market Trend

The first ten days saw a sharp recovery in prices, a continuance of the upward movement begun on the last two days of December. From the tenth to the seventeenth a large part of the earlier gains were lost with the chemical stocks leading in the general decline. The third week again witnessed somewhat higher prices, but these gains were mostly dispelled in the last few days of the month. The general average of prices for all groups, while higher than the low of last month, were well below the figures for the first few days in December. The improvement has been indeed but very slight.

Chemical Stocks

For perhaps the first time in the history of the New York Stock Exchange industrial chemical stocks moved in the opposite direction to the general market trend. Lead by Allied Chemical and Mathieson the chemical group exhibited extreme weakness as the public became cognizant of the unsettled condition in the alkali price structure. Allied Chemical showed a net loss of 17⅜ points for the month not quite matching its loss of 25 points in December. The closing prices for the five Fridays of the month for this stock were as follows 176⅞; 164; 166¾; 159½. Some note of encouragement is to be had however when the net changes in January are compared with those of December. In the latter month not one of the group shown below but what registered a loss, while in January, Allied Chemical, Air Reduction, Du Pont, Standard of New Jersey and U. S. Industrial Alcohol had losses while Anaconda, Columbian Carbon, Commercial Solvents, and Texas Gulf Sulphur showed gains. The recovery in Columbian Carbon was very pronounced. The drop in value in the chemical group between the first and the tenth was severe whereas the market was showing real bullish tendencies for the first time in weeks. When the market turned on the seventeenth, and continued to reach lower figures through the twenty-fourth, chemical stocks were recovering a large portion of their previous losses . It was not until the last five or six days of the month that the chemical stocks again moved in unison with the general price structure.

Public Interest

The relatively new position of importance held by industrial chemical stocks in financial circles and the keen interest the investing public now has in chemical securities was well illustrated in the past month. Even the daily papers commented on the weakness in several of the common stocks of prominent companies in the industry and the Wall Street Journal devoted an entire article to a review of the situation. The weakness in the stocks of the alkali producers was very confusing to the lay public. Chemical company stocks entirely divorced from the alkali industry were affected.

December Losses

Stock issues listed on the New York Stock Exchange declined $4,291,981,455 in market value in December, according to the Exchange's monthly report, issued recently. On Dec. 1 the value of all shares was $53,311,859,914, compared with $49,019,878,459 on Jan. 1. The number of shares listed increased by more than 500,000 in December. The total listed on Jan. 1, was 1,296,794,480 shares, compared with 1,296,204,097 on Dec. 1. The number of issues listed on Jan. 1 was 1,308, against 1,309 on Dec. 1.

The decline in the market value of the stocks in September was $7,577,903,894; in October, $5,117,472,488; and in November, $1,713,850,703.

In the chemical field a comparison of the value of listed stocks on the New York Stock Exchange is as follows: January 1, $3,740,863,710, December 1, $3,993,018,769, a loss of $252,155,059 during the thirty-one day period.

Foreign News

Developments abroad were of small importance other than the election of Sir Harry McGowan to the position formerly held by the late Lord Melchett. McGowan is generally considered as the financial representative of the interests back of the Imperial Chemical Industries and his election because of his outstanding ability has quieted what fears existed in England as to the effect Melchett's death would have on the corporate structure of the I. C. I.

Price Trend of Chemical Company Stocks

Name	*January 3*	*January 10*	*January 17*	*January 24*	*January 31*	*Net Change*
Allied Chemical	176⅜	164	160	166¾	159½	—17⅜
Air Reduction	101⅜	98⅜	95⅞	98½	96	— 5⅜
Anaconda	32	32	32⅞	34¾	33⅛	+ 1⅛
Columbian Carbon	79	80⅝	79	84¾	91½	+12½
Commercial Solvents	16⅛	15¾	15¾	18⅝	17¼	+ 1⅛
Du Pont	89⅞	88⅛	86½	88½	87⅞	— 2
Standard, N. J.	48⅞	50¼	47½	49⅜	47½	— 1⅜
Texas Gulf	47⅜	47¾	47	48⅝	49¾	+ 2⅜
U. S. I.	65½	63½	61	64⅜	63	— 2½

*New York Herald-Tribune.

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Chloride of Lime
Chloride of Zinc
Epsom Salts
Formic Acid
Glauber's Salt
Lactic Acid
Muriatic Acid
Nitric Acid
Oxalic Acid
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Exchange Listings

Atlas Powder

The application of the Atlas Powder Company to cancel the listing of 3,861 shares of its common stock has been approved by the Stock Exchange. This block of stock, together with 6,318 shares of Atlas Powder 6 per cent preferred stock, was approved for listing on notice of issuance last year in connection with the acquisition of the Peerless-Union Explosives Corporation. The acquisition was effected without the issuance of the 3,861 shares of Atlas Powder common, and the company therefore applied for the cancellation of this block of stock.

Listing of the 50,098 shares of capital stock of the American Agricultural Chemical Company of Delaware, in connection with the reorganization recently approved by the stockholders, has been authorized by the Exchange. Other securities of the American Agricultural Chemical Company of Delaware and of the American Agricultural Company of Connecticut are to be admitted to listing on notice of issuance.

Admitted on Notice

United States Gypsum Company—87,277 shares of preferred stock, 7 per cent cumulative, $100 par value, and 1,251,821 shares of common stock, $20 par value.

Atlas Powder Company—2,291 additional shares of 6 per cent cumulative preferred stock, $100 par value.

American Agricultural Chemical Company (Delaware)—267,777 additional shares of capital stock without par value.

American Agricultural Chemical Company (Connecticut)—41,466 shares of preferred stock without par value ($6 cumulative), and 86,316 shares of common stock without par value.

Admitted to List

American Agricultural Chemical Company (Delaware)—50,098 shares of capital stock without par value.

Armstrong Cork Company—$14,931,000 ten-year convertible 5 per cent gold debenture bonds, due June 1, 1940.

Tennessee Copper and Chemical Company—Permanent fifteen-year 6 per cent convertible debenture gold bonds, series B, due March 1, 1944.

Warner-Quinlan Company—Permanent ten-year 6 per cent convertible gold debentures, due on March 1, 1939.

Stricken From List

Tennessee Copper and Chemical Company—Temporary fifteen-year 6 per cent convertible debenture gold bonds, series B, due March 1, 1944.

New York Produce Exchange

International Match Corporation ten-year 5 per cent convertible gold debentures, 1941, when issued.

Last Two Years

Statistics prepared by the Irving Trust Co. of the high and low stock price weighted indexes by groups for 1930 and 1929 are given for the chemical group as follows:

1930	*1929*
292.7-163.1	345.6-193.2

These figures clearly indicate the decline in market values. The loss in 1930 amounted to 45 per cent and the loss in 1929 to 44 per cent.

Dividend Reports

Columbian Carbon Company declares usual extra dividend of 25 cents a share on the regular quarterly dividend of $1.25, payable February 2 to holders of voting trust certificates of record January 19.

Cerro De Pasco Copper Corp. declares quarterly dividend of 50 cents, payable February 2 to stock of record January 15 placing the stock on $2 annual basis. In the previous quarter a quarterly dividend of $1 was paid, prior to which the stock was on a $6 annual basis.

Chile Copper Co. declares regular quarterly dividend of 50 cents a share, payable March 30 to stock of record March 6.

Owens-Illinois Glass Co. declares regular quarterly dividends of 75 cents on common and $1.50 on preferred stock. Common dividend is payable February 15 to stock of record January 30, while preferred is payable April 1 to stock of record March 16.

Dividends and Dates

Company	Stock of record	Dividend	Payable
Allied Chem, com	Jan. 15	$1.50	Feb. 2
Am. Smelt., com	Jan. 16	$1.00	Feb. 2
Am. Smelt pf	Jan. 30	$1.75	Mar. 2
Anaconda	Jan. 10	62½c	Feb. 16
Archer Daniels, com	Jan. 21	50c	Feb. 1
Archer Daniels, pf	Jan. 21	$1.75	Feb. 1
Atlas Powder, pf	Jan. 20	$1.00	Feb. 2
Carman & Co., cl B	Jan. 15	25c	Jan. 26
Carman & Co., cl A	Feb. 13	50c	Feb. 28
Colgate-Palm, pf	Mar. 10	$1.50	Apr. 21
Columbian Carb	Jan. 19	$1.25	Feb. 2
Columbian Carb., ext	Jan. 19	25c	Feb. 2
duPont, deb	Jan. 10	$1.50	Jan. 24
Dow Chem, com	Feb. 2	50c	Feb. 16
Dow Chem, pf	Feb. 2	$1.75	Feb. 16
Freeport Texas	Jan. 15	$1.00	Feb. 1
Hercules Powder, pf	Feb. 3	$1.75	Feb. 14
Int. Nickel, pf	Jan. 3	$1.75	Feb. 2
Int. Print. Ink, pf	Jan. 12	$1.50	Feb. 1
Link Belt, com	Feb. 14	60c	Mar. 1
Liquid Carb., com	Jan. 20	$1.00	Jan. 31
National Carb., pf	Jan. 15	$1.75	Feb. 2
Nat'l Dist. Prod	Jan. 15	50c	Feb. 2
Nat. Lead, cl B	Jan. 16	$1.50	Jan. 31
Nat. Lead, pf A	Feb. 27	$1.75	Mar.14
New Jersey Zinc	Jan. 20	50c	Mar. 10
Oliver Filters, cl A	Jan. 20	50c	Feb. 2
Procter & Gamble, com	Jan. 24	60c	Feb. 14
Pyrene Mfg., com	Jan. 16	20c	Feb. 2
St. Joseph Lead	Mar. 9	50c	Feb. 2
Va.-Caro Chem, pf	Feb. 16	$1.75	Mar. 2
Vanadium	Feb. 2	75c	Feb. 16
Will & Baumer	Feb. 2	10c	Feb. 15
Will & Baumer, ext	Feb. 2	10c	Feb. 15
	Books Close Rights		Privilege Expires
Alum Ltd	Dec. 15		July 2
Swedish Match	—		Feb. 3

Vanadium Corp. of America declares regular quarterly dividend of 75 cents, payable February 16 to stock of record February 2.

Will & Baumer Candle Co., Inc., declares an extra dividend of 10 cents and the regular quarterly dividend of 10 cents on the common stock, both payable February 15 to stock of record February 2, and the regular quarterly dividend of $2 on the preferred stock, payable April 2 to stock of record March 16.

Carrier Engineering Corp. declares adjustment dividends of 16 2-3 cents on the common A and common B stocks for the two months ended December 31, 1930, payable January 10 to stock of record December 31. This is at the rate of 25 cents a share quarterly which was previously paid. Stock of Carrier Engineering Corp. is being exchanged for that of Carrier Corp., which will be the holding company for Carrier Engineering Corp. and other companies merged with it.

1930 Dividend Changes

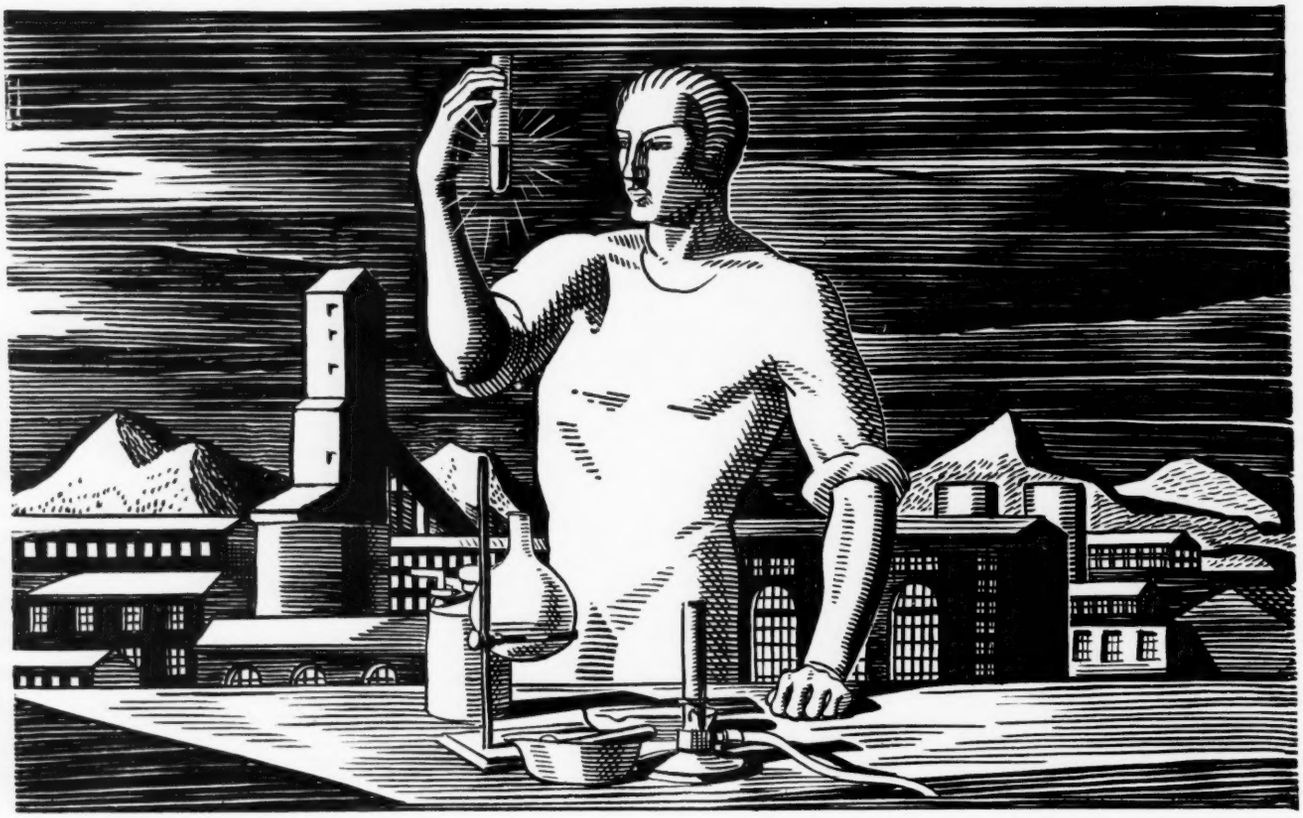
Standard Statistics reports unfavorable dividend changes in 1930 numbered 1,252 of which 405 were decreased and 847 passed. The 1929 decreases numbered 66 and those passed 228. Detailed figures for December and the twelve months for the two years follow:

	December		*12 Months*	
	1929	*1930*	*1929*	*1930*
Increased	72	15	385	215
Resumed	8	6	77	33
Extra	479	296	1,750	1,292
Initial	143	41	1,356	585
Stock	152	73	904	1,005
Decreased	14	76	66	405
Passed	53	133	228	847
Total changes	921	640	4,766	4,382

The Diamond Match Company of Illinois has been dissolved today by unanimous vote of 166,708 shares out of a total of 170,000 shares, represented by proxy at a special stockholders' meeting called for the purpose.

Glidden Co. has notified the New York Stock Exchange that it has set aside 40,000 shares of common stock to which stockholders had previously waived their rights. This is for the purpose of granting options at $20 a share to a number of executive officers and employes of the company in lieu of bonuses in cash form heretofore received under their contracts of employment.

International Match Corporation has announced new financing totaling $50,000,000 in the form of an issue of ten-year five per cent convertible debentures priced at 96, to yield more than 5.50 per cent. The offering group is headed by Lee, Higginson & Co.



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Company Reports

Du Pont Annual Report

E. I. du Pont de Nemours & Company for 1930 shows earnings applicable to common stock were $49,990,029, or $4.64 a share earned on the average number of 10,783,555 shares outstanding, which compares with $72,300,627, or $7.09 a share earned on the average number of 10,196,777 shares outstanding for 1929.

Income from operations for 1930 was $21,745,507, and in 1929 it was $34,212,150. The income from investments for 1930 was $36,653,511, including $2,993,600 extra dividend received from investment in General Motors Corporation. For 1929 it was $47,787,631 including $12,974,820 extra dividends received from investment in General Motors Corporation. The net income for 1930, after making provision for Federal income taxes and interest on bonds of subsidiary companies, was $55,962,009, which is equal to 9.4 times the debenture stock dividends and was in excess of dividend requirements of both debenture and common stock by $3,900,197. Net income for 1929 was $78,171,730.

The surplus account was increased from $144,920,215 to $208,082,665. This increase results: $3,900,197 from undivided profits for 1929; $22,457,745 from revaluation of the investment in equivalent of 9,981,220 shares General Motors common stock to $18.75 a share, which closely corresponded to the net asset value as shown on the balance sheet of General Motors Corporation, December 31, 1929; $7,767,060 from the difference between selling price ($80) and par value ($20) of 129,451 shares of common stock issued and sold to employes under the Executives' Trust and Bonus Plans; $21,353,220 represents premium (excess over par value) received for 355,887 shares of common stock issued under subscription offer; $7,684,228 from acquisition of The Roessler & Hasslacher Chemical Company representing value of the net tangible assets acquired in excess of par value of 241,130 shares common stock issued therefor.

The total gross assets of the company amount to $617,699,870. The current assets amount to $124,043,699, including: Cash, $20,611,310; Marketable Securities and Call Loans, $41,904,602; Accounts Receivable, $20,280,329; Notes Receivable, $1,790,376; and Inventories at or below cost, $39,457,080.

STATEMENT OF CONSOLIDATED INCOME

Income Account	*1930*	*1929*
Income from Operations	$21,745,507.62	$34,212,150.47
Income from Investment in General Motors Corporation	32,936,529.54 (a)	42,939,452.41 (a)
Income from Miscellaneous and Marketable Securities, etc.	3,716,981.61	4,848,179.13
Total Income	$58,399,018.77	$81,999,782.01
Provision for Federal Income Tax	2,364,359.61	3,749,358.89
Net Income before Interest on Bonds	$56,034,659.16	$78,250,423.12
Interest on Bonds of Subsidiary Companies	72,649.59	78,692.82
Net Income	$55,962,009.57	$78,171,730.30
Dividends on Debenture Stock	5,971,980.00	5,871,103.50
Amount Earned on Common Stock	$49,990,029.57	$72,300,626.80
Average number of shares of $20.00 par value common stock outstanding during the year	10,783,555	10,196,777
Amount earned a share	$4.64	$7.09

CONSOLIDATED BALANCE SHEET, DECMEBER 31, 1930

Assets

Cash	$20,611,310.55
Marketable Securities and Call Loans	41,904,602.28
Accounts Receivable	20,280,328.95
Notes Receivable	1,790,376.44
Inventories at or below Cost	39,457,080.44
Total Current Assets	$124,043,698.66
General Motors Corporation common stock—9,981,220 shares carried at $18.75 a share (9,843,750 shares of which are represented by E. I. du Pont de Nemours & Company's interest in General Motors Securities Company)	$187,147,875.00
Miscellaneous Securities	27,988,405.15
Notes Receivable for common stock sold to employes under Executives' Trust Plan	8,395,623.88
Plants and Properties	241,643,434.67
Patents, Goodwill, etc	27,698,338.20
Deferred Debit Items	782,494.22
Total Assets	$617,699,869.78

Atlas Earnings Decline

Atlas Powder Co. annual report for 1930 shows net income after all charges amounted to $1,246,432, equivalent to $2.67 a share on the company's no par value common stock, which compares with $2,542,692 in 1929. Sales for the year were $16,468,361, a decline of 25 per cent from the preceding year.

The company's strong financial position is reflected in current assets amounting to $11,466,643, which is 14.55 times current liabilities, which compares with a ratio of 13.06 last year.

In his statement to stockholders, President Leland Lyon says that the current business depression was felt most in the company's sales of cellulose products, which include lacquer, leather cloth and other coated fabrics, the demand for which was greatly curtailed by conditions prevailing in the automobile, radio and furniture industries. Sales of explosives declined 16 per cent.

The reports state that the receiver will proceed to liquidate and wind up the affairs of the Napon Rayon Corporation with a plant at Clifton, N. J., and in which the investment of the Atlas Powder Co. has been written off, excepting the value of a first mortgage on the Clifton plant. Due to "over-production and demoralized prices in the rayon industry, it was deemed unwise to attempt to finance the construction of a commercial unit of sufficient size to operate economically," the report adds.

The Atlas investment in Cia Sud-Amerucana de Explosivos in Chile remains unchanged at 15 per cent. Through property acquisition by the Societe Anonyme Francaise Zapon, of France, Atlas' interest in this company, which manufacturers leather cloth and lacquers, has been reduced from 24.5 per cent to approximately 22 per cent of the outstanding stock.

SUMMARY OF CONSOLIDATED INCOME

Income Account	*1930*	*1929*
Sales (Net)	$16,468,360.93	$22,011,930.48
Cost of Goods Sold, Delivery and Other Expenses	15,396,088.66	19,586,216.07
Net Operating Profit	$1,072,272.27	$2,425,714.41
Other Income (Net)	322,683.61	394,463.93
Gross Income	$1,394,955.88	$2,820,178.34
Federal Income Tax	148,523.66	277,486.33
Net Income for the Year	$1,246,432.22	$2,542,692.01
Dividends on Preferred Stock	549,401.70	540,000.00
Amount Earned on Common Stock	$697,030.52	$2,002,692.01
Amount Earned per Share on Common Stock	$2.67	$7.66

At a meeting of first mortgage bondholders of Asbestos Corp., Colonel Robert F. Massie stated that for fiscal year ended December 31, 1930, Asbestos Corp. would show a loss of $1,229,000 after all charges, including provision for development work, bond interest write-offs and $300,000 for depreciation.

Atlantic Refining Co. and subsidiaries for year ended December 31, 1930, shows in preliminary statement consolidated net profit of $2,742,000 after interest, depreciation, depletion, federal taxes, etc., equivalent to $1.02 a share (par $25) on 2,692,854 average shares of common stock outstanding during the year and $1.01 a share on 2,696,642 common shares outstanding at end of year. This compares with net profit in 1929 of $17,332,417, equal, after deducting $700,000 dividends paid on 7% preferred stock, now retired, to $6.79 a share on 2,448,019 average common shares outstanding during that year and $6.20 a share on 2,681,980 common share, outstanding at end of that year.

International Nickel Co. will show somewhat lower earnings for the fourth quarter of 1930 than were shown for the third quarter when 10½ cents a share on the 14,584,025 shares of common stock outstanding was earned after depreciation, depletion, federal taxes and preferred dividends, according to a report of the Wall Street Journal. Indications are that earnings for the full year will amount to around 65 cents a share on the 14,584,025 common shares outstanding, compared with $1.47 a share on 13,758,208 common shares outstanding in 1929. For the first nine months of 1930 the company reported 58 cents a share earned.

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Intermediates Division

40 Rector Street New York, N. Y.

Hercules Earnings Favorable

Hercules Powder Company reports net earnings for the year 1930 were $2,376,479, representing, after payment of regular 7 per cent preferred dividend, $2.61 per share on the company's outstanding no par common stock, according to the annual report, issued recently. Figures for the previous year, 1929, show net earnings of $4,358,904.

A strong financial position is indicated by the company's current assets which stand at $18,276,545, showing a 25.5 ratio to current liabilities, and including cash and marketable securities amounting to $8,673,655. Cash and securities show a considerable gain over last year's $6,681,129. The company's balance sheet shows total assets of $43,728,699.

During the year regular dividends amounting to $3 per share on the common stock and preferred dividends amounting to $799,687 were paid. On December 31, there were 603,079 shares of no par common stock outstanding.

	1929	*1930*
Gross Receipts	$32,976,417.86	$25,906,179.28
Net Earnings from All Sources	4,918,949.26	2,577,003.35
After deducting all expenses incident to manufacture and sale, ordinary and extraordinary repairs, maintenance of plants, accidents, depreciation, etc.		
Federal Income Tax (Estimated)	560,044.88	200,524.21
Net Profit for Period	4,358,904.38	2,376,479.14
Proceeds from sale of Capital Stock in excess of Stated Value	350,000.00	177,765.00
Surplus at Beginning of Year	12,863,378.48	13,380,595.86
Total	$17,572,282.86	$15,934,840.00
Deductions: Dividends on Preferred Stock	799,687.00	799,687.00
Dividends on Common Stock	2,392,000.00	1,805,427.75
Transferred to Reserves	1,000,000.00	
Total	4,191,687.00	2,605,114.75
Surplus at December 31	$13,380,595.86	$13,329,725.25
Earnings per Share of Common Stock	$5.95	$2.61
Dividends Paid During Period on Common Stock	$4.00	$3.00

Devoe & Raynolds Net Off

Devoe & Raynolds Co., Inc., and subsidiaries for year ended November 30, 1930, reports net income of $132,299 after depreciation, interest, federal taxes, etc., equivalent, after dividends paid on 7% first preferred stock, to $2.24 a share (par $100) on 9,355 shares of 7% second preferred stock. In year ended November 30, 1929, net income was $1,085,615, equal after dividends on 7% first and second preferred stocks, to $5.16 a share on 175,000 average number of combined Class A and B no-par common shares outstanding during that year and $4.52 a share on 200,000 combined common shares outstanding at end of year.

Sales for year ended November 30, 1930, were $13,573,329 against $16,178,861 in previous year.

Procter & Gamble and subsidiary companies for the six months ended December 31 report net earnings of $12,194,732, after depreciation, taxes and advertising charges. This compares with net earnings of $10,811,000 in the first half of 1930. Company reports purchase of the copra crushing mill properties at Baltimore of the Oil Seeds Crushing Company, the largest mill of its kind in the country. Procter & Gamble are the largest users of copra, having a crushing mill at Cincinnati.

Federated Metals Corporation and subsidiary report for the year ended Nov. 30: Net loss, after expenses, interest, dividends and $231,038 reserve for depreciation, $676,488, against a net income of $917,836, equal to $3.67 a share on the capital stock in 1929.

Pratt & Lambert, Inc., reports for the year ended Dec. 31: Net profit, after depreciation and taxes, $616,632, equal to $3.04 a share on the capital stock, compared with $1,251,587, or $6.18 a share, in 1929.

1930 Chemical Financing

The aggregate of new and additional domestic and foreign corporate securities listed on the New York Stock Exchange during the calendar year 1930 aside from government and municipal issues was $7,632,633,397, and compares with $9,151,523,107 in 1929, which was the biggest on record for any twelve months' period in the history of the Exchange.

In the chemical industry the following bonds were listed:

Name	*Amount*	*Reason*
American Metal 5½% Notes	20,000,000	Pay bank obligations
Pure Oil 5½% notes '40	20,000,000	Const.
McK & R 5½% conv. '40	22,000,000	Acquisition

STOCKS (First Six Months)

Air Reduction Co com (21,379 shs.)	*513,096	Acquis, constit cos
Allied Chemical & Dye Corp— Common (108,905 shares)	*544,525	Stock dividend
Amer Comml Alcohol Corp— Common vtc (1,180 shares)	*47,200	Working capital
Amer Solvents & Chemical Corp— Common (458,282 shares)	*458,282	Issued under recapit plan
$3 pref (189,128 shares)	*7,565,520	acquis, constit cos
Anaconda Copper Mining Co com	927,150	Acquis stocks of constit cos
Atlantic Refinery Co common	211,875	Corporate purposes
Colgate-Palmolive-Peet Co— Common (1,998,703 shares)	*24,999,310	Old stocks just listed
6% preferred	14,702,700	
Commercial Solvents Corp— Common (46,908 shares)	*111,029	Stock dividend
(E I) du Pont de Nemours & Co— Common	7,420,900	Acquis, corporate purposes
6% non-voting pref	1,702,800	Exch voting deb stock
Glidden Co com (13,704 shs)	*68,520	Stock dividends
Industrial Rayon Corp— Cap stock (9,520 shs)	*571,200	Stock dividend
Internatl Salt Co com (180,000 shs)	*6,000,000	Exch for $100 par shs
Liquid Carbonic Corp— Common (31,334 shs)	*1,504,032	Acquis constit cos
Mathieson Alkali Works— Common (2,025 shares)	*81,000	Expansion
McKesson & Robbins Inc— Common (81,711 shares)	*2,042,775	Acquisition of constituent
7% preferred	381,060$	companies
Monsanto Chemical Works— Common (11,447 shares)	*190,783	Stock dividend
Procter & Gamble Co 5% pref	*12,500,000	Working Capital, etc.
United Carbon Co com (4,812 shs)	*149,172	Old shares just listed

STOCKS (Second Six Months)

Air Reduction Co com (38,654 shs)	*966,350	Acquis of constit cos
Amer Solvents & Chemical Corp— Common (50,000 shs)	*350,000	Cancellation of conv bonds
American Smelting & Refining Co— 6% 2d preferred	20,000,000	Expansion
Am Zinc Lead & Smelting Co— Common (200,000 shs)	*5,000,000	Exchange for $25 par shs
Atlas Powder Co 6% pref	631,800	Acquis sec of affil co
Columbian Carbon Co— Common (41,161 shs)	*1,852,245	Expansion
Colgate-Palmolive-Peet Co 6% pf	2,540,900	Acquisition, &c
Commercial Solvents Corp— Common (48,456 shs)	*108,480	Stock dividend
(E I) du Pont de Nemours & Co— Common	7,141,420	Capital outlays
International Nickel Co of Can— Common (806,248 shares)	*3,353,992	Working capital
Int'l Salt Co com (240,000 shares)	*2,160,000	Acquisition
Mathieson Alkali Works— Common (11,327 shares)	*453,080	Expansion
Monsanto Chemical Works— Common (12,371 shares)	*206,190	Stock dividends
Newport Co com (521,200 shares)	*4,383,292	Old stock just listed, &c

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Paraffine Cos., Inc., reports for six months ended December 31, 1930, net profit of $1,005,632 after depreciation, federal taxes and other charges, equivalent to $2.07 a share on 485,027 shares of stock. This compares with $1,486,473 or $3.12 a share on 475,614 shares in corresponding period of 1929.

For calendar year 1930, net profit was approximately $2,075,100 after taxes and charges, equal to $4.28 a share.

Earnings at a Glance

	Net Income		*Common Share Earnings*	
	1930	*1929*	*1930*	*1929*
Atlas Pow	1,246,432	2,542,692	2.67	7.66
Atl. Ref	2,742,000	17,332,417	1.02	6.79
Colgate & P	8,550,055	8,910,631	.376	4.03
Com Sol	2,717,000	3,667,402	1.07	1.50
Devoe & R	132,299	1,085,615	2.24	4.52
Du Pont	55,962,009	78,171,750	4.64	7.09
Process Equipment				
Crock. W	143,973	407,028	.49	1.40
Link-Belt	2,310,332	3,484,686	2.89	4.54

The Industry's Stocks

1931 Jan. High	1931 Jan. Low	1931 Last	1931 High	1931 Low	1930 High	1930 Low	Sales In Jan.	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
									NEW YORK STOCK EXCHANGE					
103¾	92½	94⅞	92½	94⅞	156¾	87½		130,600	Air Reduction	No	830,000	$3.00		7.75
179½	153½	156¼	153½	156½	343	170¼		201,200	Allied Chem. & Dye	No	2,401,000	6.00		12.60
124	120¼	123½	120¼	123½	126½	120¼		3,000	7% cum. pfd.	100	393,000	7.00		76.88
26½	20	24½	20	24½	10¾	1⅝		5,100	Amer. Agric. Chem.	100	333,000		Yr. Je. '30	Nil
22	17½	...	17½	...	41½	17½		2,600	6% cum. pfd.	100	285,000		Yr. Je. '30	5.30
10½	9	9⅞	9	9⅞	33	9		9,400	Amer. Com. Alc.	No	389,000			3.22
19¼	16⅝	17	16⅝	17	51½	7		6,800	Amer. Metal Co., Ltd.	No	1,218,000	1.00		3.23
85	80	...	80	...	116	80		400	conv. 6% cum. pfd.	100	68,000	6.00		47.53
46½	40½	45	40½	45	79½	37½		108,000	Amer. Smelt. & Refin.	No	1,830,000	4.00		10.02
11⅛	129	...	129	...	141	131		1,500	7% cum. pfd.	100	500,000	7.00		43.66
3⅜	2½	3⅜	2½	3⅜	22½	2		6,200	Amer. Solvents & Chem.	No	503,000			2.56
5½	4½	5	4½	5	17⅞	3⅝		5,200	Amer. Zinc, Lead, & Smelt.	25	200,000			0.53
30	26¾	29	26¾	29	79¼	26¾		2,000	6% cum. pfd.	25	80,000			7.32
34⅞	29¾	33	29¾	33	81½	25		529,915	Anaconda Copper Mining	50	8,859,000	2.50		8.29
17	15½	16½	15½	16½	29½	13½		8,800	Archer Dan. Midland	No	550,000	2.00	Yr. Aug. '30	1.68
22⅞	18	20⅜	18	20⅜	51⅜	16⅝		81,700	Atlantic Refining Co.	25	2,690,000	1.00		6.20
52	45½	48⅛	45½	48⅞	106	42		4,700	Atlas Powder Co.	No	265,000	4.00		7.66
98⅞	97⅛	98	97⅛	98	106	97		380	6% cum. pfd.	100	96,000	6.00		28.25
1½	⅞	1⅛	⅞	1⅛	5½	⅞		3,400	Butte & Sup. Mining	10	290,000			Nil
2	1⅛	1⅛	1⅛	1⅛	4¼	1¼		7,600	Butte Copper & Zinc	5	600,000			0.34
4	2¼	3¼	2¼	3¼	15⅞	2		10,600	Certain-Teed Products	No	400,000			Nil
17	8⅛	15⅛	8⅛	15⅛	45⅛	6¾		1,600	7% cum. pfd.	100	63,000			Nil
49	47	47½	47	47½	64⅝	44		3,600	Colgate-Palmolive-Peet	No	2,000,000	2.50		4.03
95	73½	89½	73½	89½	199	65½		64,300	Columbian Carbon	No	499,000	5.00		7.84
18⅞	15⅞	17⅞	15⅞	17⅞	38	14		249,900	Comm. Solvents	No	2,530,000	1.00		1.51
82½	76½	80⅛	76½	80⅛	111⅞	65		63,200	Corn Products	25	2,530,000	3.00		5.49
150	146¼	148⅛	146¼	148⅛	151½	140		670	7% cum. pfd.	100	250,000	7.00		62.59
15⅞	13½	14⅛	13½	14⅛	43⅝	10		11,300	Davison Chem. Co.	No	504,000		Yr. Je. '30	4.00
17⅞	13	14⅛	13	14⅛	42⅞	11½		2,800	Devoe & Raynolds "A"	No	160,000	1.20		4.52
104	103½	...	103½	...	114⅞	99		60	7% cum. 1st pfd.	100	16,000	7.00		67.59
91	83⅛	86⅛	83⅛	86¼	145¼	80½		277,300	DuPont de Nemours	20	11,014,000	4.00		6.99
121½	118⅜	119⅜	118⅜	119⅜	123	114½		2,500	6% cum. deb.	100	978,000	6.00		78.54
160½	143⅜	155½	143⅜	155½	255½	142½		120,805	Eastman Kodak	No	2,261,000	5.00		9.57
130½	128⅜	129⅛	128⅜	129⅛	134	120½		570	6% cum. pfd.	100	62,000	6.00		356.89
33⅜	28⅜	33	28⅜	33	55½	24½		46,200	Freeport Texas Co.	No	730,000	4.00		5.60
34⅜	24¼	34	24¼	34	71⅛	22⅜		27,900	General Asphalt Co.	No	413,000	3.00		4.71
10	8⅜	9⅞	8⅜	9⅞	38	7		12,000	Glidden Co.	No	695,000		Yr. Oct. '30	Nil
78	69	74	69	74	105¼	63½		640	7% cum. prior pref.	100	74,000	7.00	Yr. Oct. '30	Nil
55	54½	55	54½	55	85	50		300	Hercules Powder Co.	No	603,000	3.00		5.95
119	116½	119	116½	119	123¾	116½		360	7% cum. pfd.	100	114,000	7.00		38.16
57¼	45	48	45	48	124	31		4,300	Industrial Rayon	No	200,000	4.00		7.26
3½	3⅛	3⅜	3⅛	3⅜	8½	3⅜		6,800	Intern. Agric.	No	450,000		Yr. Je. '30	1.68
49½	45	47	45	47	67½	42½		800	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30	14.58
16	14½	14½	14½	14½	44⅜	12⅜		501,700	Intern. Nickel	No	14,584,000	1.00		1.47
38⅜	37½	37⅜	37½	37⅜	45½	31		14,200	Intern. Salt	No	240,000	3.00		11.32
65⅜	52½	60½	52½	60½	148⅜	48⅜		181,500	Johns-Manville Corp.	No	750,000	3.00		8.09
11⅞	10	10⅛	10	10⅛	25	8⅜		1,400	Kellogg (Spencer)	No	598,000	0.80		2.36
46½	41⅜	45½	41⅜	45½	81⅞	39		13,200	Liquid Carbonic Corp.	No	342,000	4.00	Yr. Sep. '30	5.22
17	13	15⅜	13	15⅜	37⅜	10⅛		26,700	McKesson & Robbins	No	1,073,000	1.00		2.65
35½	31⅛	34⅛	31⅛	34⅛	49⅛	25⅛		6,400	conv. 7% cum. pref.	50	428,180	3.50		9.43
23	19	23	19	23	39½	20		2,400	MacAndrews & Forbes	No	340,000	2.60		3.13
31½	23½	23⅞	23½	23⅞	51⅜	30½		137,200	Mathieson Alkali	No	650,000	2.00		3.31
123	120	...	120	...	136	115		150	7% cum. pfd.	100	28,000	7.00		93.91
22½	20	21⅜	20	21⅜	63⅜	18⅜		4,600	Monsanto Chem.	No	416,000	1.25		4.25
29⅜	19⅜	27⅞	19⅜	27⅞	39½	18⅜		42,000	National Dist. Prod.	No	252,000	2.00		1.42
132	118½	120½	118½	120½	189½	114		4,100	National Lead	100	310,000	5.00		25.49
140¼	135⅜	140	135⅜	140	144	135		420	7% cum. "A" pfd.	100	244,000	7.00		41.95
120	118	118¼	118	118¼	120	116		1,430	6% cum. "B" pfd.	100	103,000	6.00		82.47
45	38	...	38	...	85	30		1,100	Newport $3 cum. conv. "A"	50	33,000	3.00		29.79
45½	37½	42⅛	37¼	42⅛	55⅜	26¼		61,400	Penick & Ford	No	425,000	1.00		3.97
...	...	...	...	...	111¼	107			7% cum. pfd.	100	9,000	7.00		73.33
69½	63	67½	63	67½	78⅛	52⅜		27,000	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30	3.36
11⅜	8⅜	9⅛	8⅜	9⅛	27½	7⅜		44,700	Pure Oil Co.	25	3,038,000			1.52
101⅞	96	97½	96	97½	114½	90½		1,910	8% cum. pfd.	100	130,000	8.00		22.55
41	37⅜	39⅞	37⅜	39⅞	56⅜	36⅞		23,900	Royal Dutch, N. Y. shs		894,000			3.35
27⅜	24⅜	25⅞	24⅜	25⅞	57⅛	19⅛		17,700	St. Joseph Lead	10	1,951,000	2.00		3.82
10⅛	7⅜	9⅛	7⅜	9⅛	25⅛	5⅛		132,190	Shell Union Oil	No	13,071,000			1.26
50⅛	45⅛	47⅛	45⅛	47⅛	75	42⅛		80,200	Standard Oil, Calif.	No	12,846,000	2.50		3.63
51⅛	46⅛	47⅞	46⅛	47⅞	84⅞	43⅛		380,300	Standard Oil, N. J.	25	25,419,000	1.00		4.76
25⅛	22⅛	24	22⅛	24	40⅛	19⅛		167,000	Standard Oil, N. Y.	25	17,809,000	1.60		2.23
9⅛	8⅛	8⅜	8⅛	8⅜	17	7⅜		5,300	Tenn. Corporation	No	857,000	1.00		2.19
36⅛	30⅛	32⅞	30⅛	32⅞	60⅛	28⅛		218,400	Texas Corp.	25	9,851,000	3.00		4.91
50⅛	45⅞	49	45⅞	49	67⅜	40⅞		88,500	Texas Gulf Sulphur	No	2,540,000	4.00		6.40
61	55½	58⅞	55½	58⅞	106⅜	52½		265,000	Union Carbide & Carb.	No	9,001,000	2.60		3.94
27⅜	18⅜	26	18⅜	26	84	14⅜		136,200	United Carbon Co.	No	398,000			1.94
65⅛	59⅛	61	59⅛	61	139⅜	50⅛		28,400	U. S. Ind. Alc. Co.	No	374,000	6.00		12.63
56⅛	45⅞	49⅜	45⅞	49⅜	143⅛	44⅜		1,065,400	Vanadium Corp. of Amer.	No	378,000	3.00		4.91
2½	2	2⅜	2	2⅜	8⅛	1⅜		4,500	Virginia Caro. Chem.	No	487,000		Yr. Je. '30	Nil
14⅜	9⅛	14⅜	9⅛	14⅜	34⅛	9		2,800	6% cum. part. pfd.	100	213,000		Yr. Je. '30	2.63
72	67⅛	70	67⅛	70	82⅜	67⅛		1,300	7% cum. prior pfd.	100	145,000	7.00	Yr. Je. '30	11.96
26	19⅞	25⅛	19⅞	25⅛	59½	18		2,850	Westvaco Chlorine Prod.	No	225,000	2.00		4.32
									NEW YORK CURB					
5⅞	4⅛	4⅛	4⅛	4⅛	13	3⅛		900	Acetol Prod. conv. "A"	No	60,000			0.42
69	67	67	67	67	34	16		425	Agfa Ansco Corp.	No	300,000			Nil
164⅛	140½	155¾	140½	155¾	356	140½		7,875	Aluminum Amer.	No	1,473,000			11.18
109⅛	106½	109	106½	109	111½	104		3,500	6% cum. pfd.	100	1,473,000	6.00		17.19
62	57½	...	57½	...	232	57½		1,200	Aluminum Ltd.	No	573,000			4.15
10½	7⅜	...	7⅜	...	37	6⅜		65,550	Amer. Cyanamid "B"	No	2,404,000			4.15
11⅞	7⅜	...	7⅜	...	43⅜	7⅜		13,200	Anglo-Chilean Nitrate	No	1,757,000		Yr. Je. '30	Nil
1⅜	⅝	1⅜	⅝	1⅛	6½	⅝		700	Assoc. Rayon Corp.	No	1,200,000		Yr. Je. '30	1.87
49	32¼	49	32¼	49	60⅜	31¼		6,900	conv. 6% cum. pfd.	100	200,000	6.00		

1931 Jan. High	1931 Jan. Low	1931 Last	1931 High	1931 Low	1930 High	1930 Low	Sales In Jan.	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
1⅞	1⅛	...	1⅛	...	5¼	1⅛	3,800		Brit. Celanese Am. Rcts.	2.43	2,806,000		0.03	
54⅝	49	49	49	49	90	48	175		7% cum. part. 1st pfd.	100	148,000	7.00	14.50	
72	68¼	68¼	68¼	68¼	90	70	530		7% cum. prior pfd.	100	115,000	7.00	25.70	
10	3½	...	3½	...	20	3½	6,140		Celluloid Corp.	No	195,000		1.76	
...	...	...	...	...	103	90½			7% cum. 1st part. pfd.	No	24,000	7.00	8.59	
9	8	...	8	...	13¼	8⅜	1,300		Courtaulds, Ltd.	1£			0.34	
51	45	...	45	...	100	49	1,400		Dow Chemical	No	630,000	2.00	4.08	
75½	63⅜	68	63⅜	68	166⅞	58½	25,200		Gulf Oil	25	4,525,000	1.50	9.83	
13	12¼	13	12¼	13	23	10½	300		Heyden Chemical Corp.	10	150,000		3.08	
...	...	...	...	...	7	4			Imperial Chem. Ind.	1£			0.49	
...	...	...	...	...	16	3½			Monroe Chem.	No	126,000		2.54	
					42	15½			Newport Co.	No	618,928	2.00	12.78	
51⅛	47⅜	...	47¾	...	79½	45	1,800		Shawinigan W. & P.	No	2,178,000	2.50	2.35	
63	60	...	60	...	85	58	600		Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30 4.14	
8	5¼	5¼	5¼	5¼	34½	3½	1,700		Silica Gel Corp.	No	600,000			
38½	35⅝	37	35⅝	37	59⅞	30	95,100		Standard Oil Ind.	25	16,851,000	2.50	4.66	
30⅜	28⅛	29	28⅛	29	34½	27	5,300		Swift & Co.	25	6,000,000	2.00	2.18	
4¾	3⅝	4¼	3⅝	4¼	22¾	3	5,400		Tubize "B"	No	600,000	10.00		
									United Chemicals					
21	14	20	14	20	44	14	6,200		$3 cum. part. pfd.	No	115,000	3.00	7.66	
42⅛	39¼	41	39¼	41	58	31	2,100		U. S. Gypsum Co.	20	1,170,000	1.60	3.98	
									CLEVELAND					
94	92	91	92	91	96	91½	555		Cleve-Cliffs Iron, $5 pfd.	No	498,000	5.00	11.42	
65	59⅜	65	59⅜	65	85	57½	2,851		Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30 4.14	
									CHICAGO					
...	...	...	...	...	46¾	33½			Abbott Labs.	No	145,000	2.50	4.92	
5½	3½	5½	3½	5½	15	3½	830		Monroe Chem.	No	126,000		2.54	
22	21	21	21	21	35	15½	210		$3.50 cum. pref.	No	30,000	3.50	13.35	
30½	27⅛	29	27⅛	29	33¾	27	19,250		Swift & Co.	25	6,000,000	2.00	2.18	
									CINCINNATI					
69	61	67¾	61	67¾	110	53⅛	6,375		Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30 3.36	
									PHILADELPHIA					
..	...	...	...	...	100	89			Pennsylvania Salt	50	150,000	5.00	Yr. Je. '30 7.97	
									MONTREAL					
½	¼	⅜	¼	⅜	...	...	725		Asbestos Corp.	No	200,000		Nil	
...	...	...	...	...	...	...			7% non-cum pfd.	100	75,000		0.24	

The Industry's Bonds

1931 Jan. High	1931 Jan. Low	1931 Last	1930 High	1930 Low	1929 High	1929 Low	Sales In Jan.	Sales During 1931	ISSUE	Date Due	Int. %	Int. Period	Out-standing $
									NEW YORK STOCK EXCHANGE				
104⅛	102⅜	104⅛	105⅛	102	106½	103	121		Amer. Agric. Chem., 1st ref. s. f. 7½s.	1941	7½	F. A.	7,667,000
99	92	93	100⅛	93	99¾	99¾	20		Amer. Cyan. deb. 5s.	1942	5	A. O.	4,554,000
101½	96⅜	99½	177	94⅜	135	95	920		Amer. I. G. Chem. conv. 5½s.	1949	5½	M. N.	29,933,000
104½	102	102½	104	101	102¾	98	361		Am. Smelt & Ref. 1st. 5s. "A"	1947	5	A. O.	36,578,000
68	65½	70½	98½	67	100	79	192		Anglo-Chilean s. f. deb. 7s.	1945	7	M. N.	14,600,000
102⅞	101	101½	103	100	103½	99¾	118		Atlantic Refin. deb. 5s.	1937	5	J. J.	14,000,000
102	100⅜	...	105½	100½	103	98½	70		Interlake Iron Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
104½	103	104½	104½	97½	103	96½	5		Corn Prod. Refin. 1st s. f. 5s.	1934	5	M. N.	1,822,000
59½	40	56½	87½	38	104	76	653		Lautaro Nitrate conv. 6s.	1954	6	J. J.	32,000,000
96	85½	90½	100½	87	100½	96	128		Pure Oil s. f. 5½% notes	1937	5½	F. A.	17,500,000
103	88	97	104	93¾	98¾	90	193		Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
105½	163½	103⅜	104½	100	103½	100	561		Standard Oil, N. J. deb. 5s.	1946	5	F. A.	120,000,000
106½	98½	99	104½	96½	100	91¾	652		Standard Oil, N. Y. deb. 4½s.	1951	4½	J. D.	50,000,000
99	89½	97	102½	90¼	110	88	32		Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
									NEW YORK CURB				
104½	102⅜	104½	104⅞	100½	103½	99¾	227,000		Aluminum Co., s. f. deb. 5s.	1952	5	M. S.	37,115,000
104½	97	98½	104½	96⅜	98⅜	97⅜	189,000		Aluminum Ltd., 5s.	1948	5	J. J.	20,000,000
54½	53½	54½	60	51	125	99	12,000		Amer. Solv. & Chem. 6½s.	1936	6½	M. S.	1,737,000
34	29½	30½	...	...	...	...	12,000		General Ind. Alc., 6½s.	1944	6½	M. N.	2,351,000
53	48	49	80	51	95	60	76,000		General Rayon 6s. "A"	1948	6	J. D.	5,085,000
102½	100½	102	104	90½	101¼	97¾	295,000		Gulf Oil, 5s.	1937	5	J. D.	30,414,000
103½	101	102¾	104	99	...	...	177,000		Sinking Fund deb. 5s.	1947	5	F. A.	35,000,000
101⅜	99½	100	103½	95½	100½	93	163,000		Koppers G. & C. deb, 5s.	1947	5	J. D.	23,050,000
95½	92½	94⅜	98½	90⅜	94¼	88½	558,000		Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
95⅜	94½	95	98¾	90¾	...	...	270,000		4½s., series "B"	1968	4½	M. N.	16,108,000
90	90	90	107	96	...	...	5,000		Silica Gel Corp. 6½s	1932	6½	A. O.	1,700,000
103½	102½	103½	103½	79½	102	97½	92,000		Swift & Co., 5s.	1944	5	J. J.	22,916,000
101⅛	101	101⅛	103½	100½	104	98	48,000		Westvaco Chlorine Prod. 5½s.	1937	5½	M. S.	1,992,000

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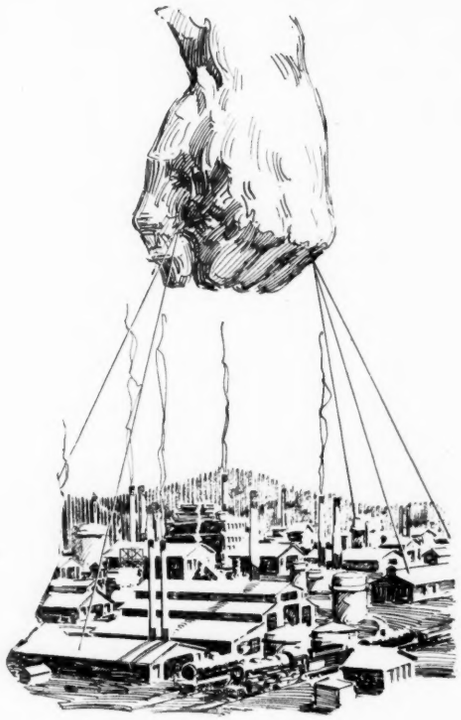

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13th Exposition CHEMICAL INDUSTRIES

Management International Exposition Company

The Trend of Prices

IMPORTANT PRICE CHANGES

Advances	January 1931	December 1930
Alphanaphthol	.73	.60
Paratolindine	.44	.38
Declines		
Acetone	.10	.11
Acid Cresylic	.50	.60
Benzol	.19	.21
Butyl Alcohol	.15½	.16½
Copper	.09¾	.10
Cream of Tartar	.23¾	.24¾
Cresol U. S. P.	.13	.14
Dephenylamine	.37	.38
Toluol	.28	.29
Sodium Acetate	.04½	.05

The market for industrial chemicals showed some degree of improvement in January over the low figures for December, but still continues to be affected by several unfavorable situations. The alkali market has apparently stabilized itself at the reduced prices announced early in the month. The coal-tar group however, which has been a prop to the market during the last six months' period showed pronounced weakness in many of the more important numbers of the group. Benzol was reduced 1c on two occasions, bringing the current level down to 19c. In sympathy with this decline, cresylic acid, U. S. P. cresol, diphenylamine, toluol, and one or two others of this division were quoted at lower prices. On the other hand, aphanaphthol and paratoluidine were higher.

Solvents Weaker

Another unfavorable angle to the market was the weakness in the solvents. With corn at extremely low figures, leading producers of acetone and butyl alcohol announced reductions, in each case of 1c. Lead, copper and zinc were lower at the close of the month than at the opening. Sodium acetate was reduced ½c, and cream of tartar and tartaric acid were again lower with the competitive position particularly keen. Disquieting rumors were heard of further unsettlement in a number of the leading industrial chemicals.

In the gum, fats and oils, wax and naval stores industries prices were again at lower levels with buying limited, in the majority of instances, to replacement quantities. Consumers have shown little inclination to contract ahead. Until some definite turn in the trend of the market occurs it is very unlikely that this determination on the part of buyers will change. With large surpluses still to be worked off the present market belongs decidedly to the buyer.

General Business

Industrial activity expanded in January. It could hardly do differently when consideration is given to the low state of December figures for steel, automobile, and rubber production. The first three weeks were encouraging with definite improvement plainly discernible. As is the case, however, in most periods of depression when the worst is presumably over, outside influences force their way into the picture and retard and often destroy the recovery. With the possibility, admittedly remote, of an immediate cash payment to the war veterans involving tremendous governmental refinancing, the stock and bond markets weakened near the close of the month and business suffered a decided setback. Business has now arrived at that state where the balance is super-sensitive to the slightest bit of favorable or unfavorable news.

While steel mills and automobile factories were more active operations in the building lines were restricted further. Petroleum production again showed an increase, but this is viewed with disfavor as sales did not keep pace with the rate of production and reserve stocks were again higher.

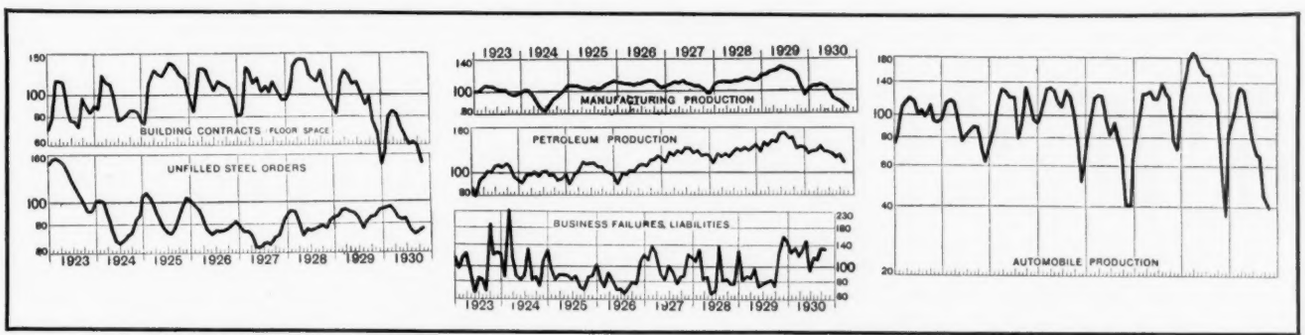
The weather during the greater portion of the month was mild in most sections of the country. While this condition aided some industries it injured others. The sale of coal was disappointing, and antifreeze business was below expectations.

Commodity markets were steadier, generally speaking, but, there were several reductions of importance, rayon being specially weak.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, Dec.	5,832	6,239	7,812
†Brokers Loans	$1,734	$1,757	$3,345
*Building Contracts, Dec.	$249,935	$253,573	$316,368
*Car Loadings	725	714	847
†Commercial Paper, Nov. 29	$448	$485	$581
Factory Payrolls, Dec.	73.7	75.1	99.1
*Mail Order Sales, Dec.	$72,486	$65,713	$90,019
Number of Failures Dun, Dec.	$83,683	$55,260	$67,465
*Merchandise Imports, Dec.	$209,000	$204,700	$510,573
*Merchandise Exports, Dec.	$273,000	$289,000	$426,956
Furnaces in Blast % Jan. 1	30.3	34.1	49.4
*Steel Unfinished Orders, Dec. 31	3,943	3,639	4,417

*000 omitted.
†000,000 omitted.



Business indicators prepared by the Department of Commerce. The weekly average 1923-25 inclusive = 100
The solid line represents 1930 and the dotted line 1929

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

Acetone — Producers announced on January 1 a new price schedule effective immediately. Drums, carlots, 10¼c; less than carlots, 11c-13c; tanks, 10c. Although the demand for spot deliveries and inquiries for future shipments were in better volume with the turn of the year, business was still below normal.

Acetanilid — Effective January 13, a new schedule was announced as follows,

Barrels	Per Pound	.24c
Kegs	" "	.25c
25 lb. box	" "	.29c
If 50 lbs. 2c per lb. Less		
5 lb. Cartons incl.	" "	.35c
1 lb. Cartons incl.	" "	.37c
¼ lb. Cartons incl.	" "	.51c
If 25 lbs.—2c Less		
Oz. cartons	Per Ounce	.06½c

Acid Acetic — Manufacturers reported further gains in the tonnages moving out into the consuming industries. With 1931 contracts out of the way, the price structure assumed a firmer tone as the end of the month approached.

Acid Boric — No changes of consequence have occurred in the acid or the borax market in several months. The rate of shipments is said to have picked up with the opening of the new year and is now in satisfactory volume.

Acid Citric — Following the reductions in December, the market steadied and a decided increase in demand has eased at least for the moment the competitive situation.

Acid Cresylic — A rather drastic reduction was made on January 18 in several grades of this commodity, 97-99% being quoted at 50c a gal., a reduction of 10c, and the 95% grade being quoted at 47c, a reduction of 8c. The price structure of the coal tar derivatives has shown much better stability than either the alkali or solvent groups. Some concessions, however, have been waited for by the larger buyers and the reductions in the cresols, toluol and benzol were made, it is thought, to consummate 1931 contracts.

Acid Formic — Several outlets were taking shipments in encouraging quantities. A slight improvement was noted in the Paterson-Passaic area as the silk companies started operations on a heavier schedule.

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21 .18½	.21	.21	.18½	.21	.18½
Acetaldol, 50 gal dr.....lb.	.27	.31 .27	.31	.31	.27	.31	.27
Acetamide.....lb.	1.20	1.35 1.20	1.35	1.35	1.20		
Acetanilid, tech, 150 lb bbl...lb.	.21	.23 .21	.23	.23	.21	.24	.21
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.25	.28 .25	.28	.29	.25	.35	.28
Acetin, tech drums.....lb.	.30	.32 .30	.32	.32	.30	.32	.30
Acetone, tanks.....lb.	.10	.10½ .10	.10½	.12	.11	.16	.11
Acetone Oil, bbls NY.....gal.	1.15	1.25 1.15	1.25	1.25	1.15	1.25	1.15
Acetyl Chloride, 100 lb cby...lb.	.55	.68 .55	.68	.68	.55	.68	.45
Acetylene Tetrachloride (see tetrachlorethane).....							
Acids							
Acid Acetic, 28% 400 lb bbls c-1 wks.....100 lb.	.....	2.60	2.60	3.88	2.60	3.88	3.88
Glacial, bbl c-1 wk.....100 lb.	.....	9.23	9.23	13.68	9.23	13.68	13.68
Glacial, tanks.....	.....	8.98	8.98	13.43	8.98		
Anthranilic, refd, bbls.....lb.	.85	.95 .85	.95	1.00	.85	1.00	.98
Technical, bbls.....lb.	.75	.80 .75	.80	.80	.75	.80	.80
Battery, cbys.....100 lb.	1.60	2.25 1.60	2.25	2.25	1.60	2.25	1.60
Benzoic, tech, 100 lb bbls....lb.	.40	.45 .40	.45	.53	.40	.60	.51
Boric, crys. powd, 250 lb bbls.....lb.	.06¾	.07¾ .06¾	.07¾	.07¾	.06¾	.07¾	.05¾
Broenner's, bbls.....lb.	1.20	1.25 1.20	1.25	1.25	1.20	1.25	1.25
Butyric, 100% basis cbys.....lb.	.80	.85 .80	.85	.90	.80	.90	.85
Camphoric.....lb.	.....	5.25	5.25	5.25	5.25	5.25	4.85
Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½ .04½	.05½	.05½	.04½	.05½	.04½
Chromic, 99%, drs extra.....lb.	.15	.17 .15	.17	.19	.15	.23	.17½
Chromotropic, 300 lb bbls...lb.	1.00	1.06 1.00	1.06	1.06	1.00	1.06	1.00
Citric, USP, crystals, 230 lb bbls.....lb.	.40	.43 .40	.43	.59	.40	.70	.46
Cleve's, 250 lb bbls.....lb.	.52	.54 .52	.54	.54	.52	.59	.52
Cresylic, 95%, dark drs NY..gal.	.47	.60 .47	.60	.70	.54	.54	.60
97-99%, pale drs NY.....gal.	.50	.60 .50	.60	.77	.58	.77	.72
Formic, tech 90%, 140 lb. cby.....lb.	.10½	.12 .10½	.12	.12	.10½	.12	.10½
Gallic, tech, bbls.....lb.	.60	.70 .60	.70	.55	.50	.12	.50
USP, bbls.....lb.	.....	.74	.74	.74	.74	.55	.74
Gamma, 225 lb bbls wks.....lb.	.77	.80 .77	.80	.80	.77	.80	.74
H, 225 lb bbls wks.....lb.	.65	.70 .65	.70	.70	.65	.99	.80
Hydriodic, USP, 10% soln cby lb.	.....	.67	.67	.67	.67	.72	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48 .45	.48	.48	.45	.67 .48	.45
Hydrochloric, CP, see Acid Muriatic.....				.....	.....	.....	.....
Hydrocyanic, cylinders wks...lb.	.80	.90 .80	.90	.90	.80	.90	.80
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	.....	.06	.06	.06¼	.06	.06	.06
Hydrofluosilicic, 35%, 400 lb bbls wks.....lb.	...11	.12 .11	.12	.12	.11	.11	.11
Hypophosphorous, 30%, USP, demijohns.....lb.	.....	.85	.85	.85	.85	.85	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½ .04	.04½	.05	.04	.05½	.04½
44%, light, 500 lb bbls.....lb.	.11½	.12 .11½	.12	.12	.11	.12½	.11
Laurent's, 250 lb bbls.....lb.	.36	.42 .36	.42	.42	.36	.42	.40
Malic, powd., kegs.....lb.	.45	.60 .45	.60	.60	.45	.60	.48
Metanilic, 250 lb bbls.....lb.	.60	.65 .60	.65	.65	.60	.65	.60
Mixed Sulfuric-Nitric.....							
tanks wks.....N unit	.07	.07½ .07	.07½	.07½	.07	.07½	.07
tanks wks.....S unit	.008	.01 .008	.01	.01	.008	.01	.008
Monochloroacetic, tech bbl..lb.	.20	.30 .20	.30	.30	.18	.21	.18
Monosulfonic, bbls.....lb.	1.65	1.70 1.65	1.70	1.70	1.65	1.70	1.65
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	.....	1.35	1.35	1.35	1.35	1.40	1.35
tanks, wks. 100 lb.		1.00	1.00	1.00	1.00	1.00	1.00
20 degrees, cbys wks...100 lb.	.....	1.45	1.45	....	1.45	....	1.45
N & W, 250 lb bbls.....	.85	.95 .85	.95	.95	.85	.95	.85
Naphthionic, tech, 250 lb.....	.....	Nom.....	Nom.	Nom.	.....	.59	.55
Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	.....	5.00	5.00	5.00	5.00	5.00	5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	.....	6.00	6.00	6.00	6.00	6.00	6.00
Oxalic, 300 lb bbls wks NY...lb.	.11	.11½ .11	.11½	.11¾	.11	.11¾	.11
Phosphoric 50%, U. S. P.....lb.	.....	.14	.14	.14	.14	.14	.08
Syrupy, USP, 70 lb drs....lb.	.....	.14	.14	]	.14	.16	.14
Commercial, tanks,.....Unit.	.....	.80	.80	.80	.80	.....	.....
Picramic, 300 lb bbls.....lb.	.65	.70 .65	.70	.70	.65	.70	.65
Picric, kegs.....lb.	.30	.50 .30	.50	.50	.30	.50	.30
Pyrogallic, crystals.....							
.....lb.	1.50	1.60 1.50	1.60	1.60	1.30	1.40	.86
Salicylic, tech, 125 lb bbl.....lb.	.33	.37 .33	.37	.37	.33	.42	.33
Sulfanilic, 250 lb bbls.....lb.	.15	.16 .15	.16	.16	.15	.16	.15
Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95 1.60	1.95	1.95	1.60	1.95	1.60
tanks, wks. ton		15.00	15.00	15.50	15.00	15.50	15.50
1500 lb dr wks.....100 lb.	1.50	1.65 1.50	1.65	1.65	1.50	1.65	1.50
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½ 1.27½	1.42½	1.42½	1.27½	1.42½	1.27½
Oleum, 20%, 1500 lb. drs 1c-1 wks ....ton	.....	18.50	18.50	18.50	18.50	18.50	18.50

4 NEW PRODUCTS

CARBIDE AND CARBON CHEMICALS CORPORATION announces the commercial production of three new propylene compounds and of triethylene glycol.

Propylene glycol, propylene dichloride and propylene oxide are available in quantities up to one-ton lots.

Triethylene glycol is available in tank-car quantities.

The properties and potential uses of each of these compounds are given in the table below. Our Technical Department will be very glad to give any additional information required—a coupon is provided for your convenience in making a request.

MATERIAL	BOILING POINT	SPECIFIC GRAVITY	POTENTIAL USES
PROPYLENE GLYCOL	188°C	1.03 AT 20°C	MOISTENING AGENT, SOLVENT AND REAGENT
PROPYLENE DICHLORIDE	96.8°C	1.16 AT 15°C	SOLVENT
PROPYLENE OXIDE	35°C	.86 AT 15°C	REAGENT IN ORGANIC SYNTHESIS
TRIETHYLENE GLYCOL	276°C	1.125 AT 20°C	MOISTENING AGENT, SOLVENT AND REAGENT

PRODUCTS MANUFACTURED BY CARBIDE AND CARBON CHEMICALS CORPORATION

ACETONE	ETHYLENE DICHLORIDE
BUTYL CARBITOL ★	ETHYLENE GLYCOL
BUTYL CELLOSOLVE ★	ETHYLENE OXIDE
CARBITOL ★	ISOPROPANOL
CARBOXIDE ★	ISOPROPYL ETHER
CELLOSOLVE ★	METHYL CELLOSOLVE ★
CELLOSOLVE ★ ACETATE	METHANOL
DICHLOR ETHYL ETHER	TRIETHANOLAMINE
DIETHYLENE GLYCOL	VINYL CHLORIDE
DIOXAN	VINYLITE ★ RESINS

BUTANE	ETHYLENE	ISOBUTANE
ETHANE	PROPANE	PROPYLENE
ACTIVATED CARBON		★ Trade-mark registered

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd Street, New York

230 N. Michigan Avenue, Chicago

Unit of Union Carbide UCC *and Carbon Corporation*

CARBIDE AND CARBON CHEMICALS CORPORATION
New York, N. Y. CM

Please send me further information about your _____ (*Name of product*)

Name _____

Company _____

Street _____

City _____ *State* _____

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

Acid Chromic — With the automotive industry stepping up schedules a better demand was in evidence in the last two weeks of the month. The price structure remains unchanged. The automobile industry consumes 26 per cent of the chromic acid consumed. Job plating shops are the second largest users, taking about 23 per cent. The following table shows percentages used in other lines:

	Per cent.
Automobile industry	26
Job plating shops	23
Plumbing industry	16
Jewelry industry	8
Household electrical appliance industry	4
Tool and die industry	4
Heavy machinery industry	3
Printing and engraving industry	2
Bicycle industry	2
Soda Fountain industry	1
Stove industry	1
Textile industry	1
Sewing machine industry	1
Miscellaneous	8
Total	100

Acid Lactic — The leather industry was reported as being active in the technical grades. The price remains unchanged.

Acid Muriatic — Producers had little to report in the way of change. Shipments under contract were going forward in satisfactory tonnage while some increase in spot sales were noticeable in the textile centers.

Acid Oxalic — The demand from most consuming channels was fairly satisfactory. No change in the price structure has occurred.

Acid Sulfuric — The firmness that has characterized the situation in most sections continued throughout the past month. Little new business of large character was placed but deliveries under contract were in fair volume.

Acid Tartaric — On January 6, leading producers announced a further reduction of 1c a lb. and were quoting 31½c per lb. in barrels for either the granular or the powdered, U.S.P. grade with ½c differential on crystal material, all prices f.o.b. plant. With a rather keen competitive condition existing in the cream of tartar market the acid has felt this state of unsettlement.

Alcohol — The primary interest in the alcohol field was the anti-freeze demand. Due to the rather unseasonably warm weather prevailing during the greater portion of the month shipments were smaller than had been hoped for. However, leading producers appeared to be

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
40%, 1c-1 wks net ton	.....	42.60	.....	42.00	42.00	42.00	42.00	42.00
Tannic, tech, 300 lb bbls. lb.	.23	.40	.23	.40	.40	.23	.40	.30
Tartaric, USP, gran. powd, 300 lb. bbls lb	.....	.31½	.....	.31½	.38½	.33	.38½	.38
Tobias, 250 lb bbls. lb.	.....	.85	.....	.85	.85	.85	.85	.85
Trichloroacetic bottles lb.	.....	2.75	.....	2.75	2.75	2.75	2.75	2.75
Kegs lb.	.....	2.00	.....	2.00	2.00	2.00	2.00	2.00
Tungstic, bbls lb.	1.40	1.70	1.40	1.70	1.70	1.40	2.25	1.00
Albumen, blood, 225 lb bbls. lb.	.38	.40	.38	.40	.40	.38	47	.38
dark, bbls., lb.	.12	.20	.12	.20	.20	.12	.20	.12
Egg, edible lb.	.55	.56	.55	.56	.75	.55	.83	.70
Technical, 200 lb cases lb.	.50	.55	.50	.55	.73	.50	.80	.70
Vegetable, edible lb.	.60	.65	.60	.65	.65	.60	.65	.60
Technical lb.	.50	.55	.50	.55	.55	.50	.55	.50
Alcohol								
Alcohol Butyl, Normal, 50 gal drs c-1 wks lb.	.16½	.17½	.16½	.17½	.18½	.17½	.17½	.17½
Drums, 1-c-1 wks lb.	.16½	.17½	.16½	.17½	.18½	.17½	.18½	.17½
Tank cars wks lb.	.15½	.16½	.15½	.16½	.17½	.16½	.17½	.16½
Amyl (from pentane) Tanks wks lb.	.....	.236	.....	.236	.236	.236	1.67	1.67
Diacetone, 50 gal drs del. gal.	1.42	1.60	1.42	1.60	1.60	1.42	1.80	1.42
Ethyl, USP, 190 pf, 50 gal bbls gal.	2.63	2.75	2.63	2.75	2.75	2.63	2.75	2.69½
Anhydrous, drums gal.	.56	.60	.56	.60	.71	.56	.71	.71
Completely denatured, No. 1, 188 pf, 50 gal drs drums extra gal.	.40	.47	.40	.47	.51	.40	.52	.49
No. 5, 188 pf, 50 gal drs. drums extra gal.	.40	.44	.40	.44	50	.40	.51	.48
Tank, cars gal.	.37	.38	.37	.38	.48	.37	.50	.46
Isopropyl, ref, gal drs. gal.	.60	1.00	.60	1.00	1.00	.60	1.30	1.00
Propyl Normal, 50 gal dr. gal.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Alcotate, tanks 60c a gal.	.....	.....	.....	.....	.....	.....	.....	.....
Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.80	.82	.82	.80	.82	.80
Alpha-Naphthol, crude, 300 lb bbls lb.	.....	.73	.....	.73	.65	.60	.65	.65
Alpha-Naphthylamine, 350 lb bbls lb.	.32	.34	.32	.34	.34	.32	.34	.32
Alum Ammonia, lump, 400 lb bbls, 1c-1 wks 100 lb.	3.20	3.50	3.20	3.50	3.50	3.20	3.50	3.25
Chrome, 500 lb casks, wks 100 lb.	4.50	5.25	4.50	5.25	5.25	4.50	5.50	5.00
Potash, lump, 400 lb casks wks 100 lb.	3.10	3.50	3.10	3.50	3.50	3.10	3.50	3.00
Soda, ground, 400 lb bbls wks 100 lb.	3.50	3.75	3.50	3.75	3.75	3.50	3.75	3.75
Aluminum Metal, c-1 NY 100 lb.	22.90	24.30	22.90	24.30	24.30	24.30	24.30	24.30
Chloride Anhydrous, lb.	.05	.09	.05	.09	.15	.05	.20	.05
Hydrate, 96%, light, 90 lb bbls lb.	.16	.17	.16	.17	.18	.16	.18	.17
Stearate, 100 lb bbls. lb.	.19	.22	.19	.22	.26	.19	.26	25
Sulfate, Iron, free, bags c-1 wks 100 lb.	1.90	1.95	1.90	1.95	2.05	1.90	2.05	1.95
Coml, bags c-1 wks. 100 lb.	1.25	1.30	1.25	1.30	1.40	1.25	1.40	1.40
Aminoazobenzene, 110 lb kegs lb.	.....	1.15	.....	1.15	1.15	1.15	1.15	1.15
Ammonium								
Ammonia anhydrous Com. tanks	.....	.05⅝	.....	.05⅝	.05½	.05½		
Ammonia, anhyd, 100 lb cyl. lb.	.15¼	.15½	.15¼	.15½	.15½	.15½	.14½	.14
Water, 26°, 800 lb dr del. lb.	.....	.03½	.....	.03½	.03½	.03½	.03½	.03½
Ammonia, aqua 26° tanks	.02½	.02½	.02½	.02½	.02½	.02½		
Acetate lb.	.28	.39	.28	.39	.39	.28		
Bicarbonate, bbls., f.o.b. plant 100 lb.	.....	5.15	.....	5.15	5.15	5.15	6.50	5.15
Bifluoride, 300 lb bbls. lb.	.21	.22	.21	.22	.22	.21	.22	.21
Carbonate, tech, 500 lb cs. lb.	.09	.12	.09	.12	.12	.09	.12	.09
Chloride, white, 100 lb. bbls wks 100 lb.	4.45	5.15	4.45	5.15	5.15	4.45	5.15	4.45
Gray, 250 lb bbls wks. lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Lump, 500 lb cks spot. lb.	.11	.11½	.11	.11½	.11½	.11	.11½	.11
Lactate, 500 lb bbls. lb.	.15	.16	.15	.16	.16	.15	.16	.15
Nitrate, tech, casks. lb.	.06	.10	.06	.10	.10	.06	.10	.06
Persulfate, 112 lb kegs. lb.	.26	.30	.26	.30	.30	.26	.34	.26
Phosphate, tech, powd, 325 lb bbls lb.	.11½	.12	.11½	.12	.13	.11½	.13	.12½
Sulfate, bulk c-1 100 lb.	1.70	1.75	.11½	.12	2.10	1.75	2.40	2.05
Southern points 100 lb.	.....	1.88	1.70	1.75	2.10	1.82½	2.45	2.05
Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f. ton	34.60	35.00	34.60	35.00	57.60	45.00	60.85	52.40
Sulfocyanide, kegs. lb.	.36	.48	.36	.48	.48	.36	.48	.36
Amyl Acetate, (from pentane) Tanks lb.	.....	.222	.....	.222	.236	.222	1.70	1.60
Tech., drs lb.	.225	.236	.225	.236	.24	.225	.24	.23
Alcohol, see Fusel Oil								
Furoate, 1 lb tins lb.		5.00	.....	5.00	5.00	5.00		
Aniline Oil, 960 lb drs. lb.	.15	.16	.15	.16	.16	.15	.16½	.15
Annatto, fine lb.	.34	.37	.34	.37	.37	.34	.37	.34
Anthraquinone, sublimed, 125 lb bbls lb.	.50	.55	.50	.55	.90	.50	.90	.80
Antimony, metal slabs, ton lots lb.	.07	.07½	.07	.07½	.09½	.06½	.10	.08½
Needle, powd, 100 lb cs. lb.	.08½	.09	.08½	.09	.09½	.08	.10	.09
Chloride, soln (butter of) cbys lb.	.13	.17	.13	.17	.17	.13	.18	.13
Oxide, 500 lb bbls. lb.	.08½	.08½	.08½	.08½	.08½	.07½	.10	.08½
Salt, 66%, tins lb.	.22	.24	.22	.24	.24	.22	.26	.24
Sulfuret, golden, bbls. lb.	.16	.20	.16	.20	.20	.16	.20	.16
Vermilion, bbls lb.	.38	.42	.38	.42	.42	.38	.42	.38
Archil, conc, 600 lb bbls. lb.	.17	.19	.17	.19	.19	.17	.19	.17
Double, 600 lb bbls. lb.	.12	.14	.12	.14	.14	.12	.14	.12
Triple, 600 lb bbls. lb.	.12	.14	.12	.14	.14	.12	.16	.12
Argols, 80%, casks lb.	.....	.18½	.....	.18½	.18½	.18½	.18½	.18½
Crude, 30%, casks. lb.	.07½	.08	.07½	.08	.08	.07½	.08	.08

CITRIC ACID

"The Gold Medal Standard"

The tart taste of the citrus fruits was familiar to the ancients, but Citric Acid itself was not discovered until 1784, when Carl Wilhelm Scheele isolated it from lemon juice. A number of years elapsed before commercial production was started.

Powers & Weightman of Philadelphia were the pioneer manufacturers in this country, and in the year 1875 the Franklin Institute awarded them the Cresson Medal "for the perfection of result in the product obtained." Powers & Weightman later became Powers-Weightman-Rosengarten Co., who in turn merged their interests with Merck & Co.

The skill and experience acquired in the manufacture of Citric Acid during 57 years of continuous operation, and the priceless tradition of upholding "the Gold Medal Standard", are now the heritage of MERCK & CO. INC.

The plant at East Falls, Philadelphia, has been thoroughly modernized to meet the increasing demand of today.

The Elliott Cresson Gold Medal awarded in 1875 to Powers & Weightman (now Merck & Co. Inc.) "for the introduction of an industry new in the United States and perfection of result in the product obtained in the manufacture of Citric Acid."

The original building (*above*) at East Falls, where Citric Acid was first made in this country, and (*right*) the plant as it looks today.

MERCK & CO. INC.

MANUFACTURING CHEMISTS

Industrial Division:
P. O. Box 1625
Philadelphia

SUCCESSORS TO
POWERS-WEIGHTMAN-ROSENGARTEN CO.

New York RAHWAY, N. J. St. Louis

In Canada:
MERCK & CO. LTD.
Montreal

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

satisfied with shipments to date. The price structure, which has been quite firm for several months, showed indications of slight weakness and some shading of established prices were reported.

Alums — Contrary to general expectations the turn of the year did not bring as heavy shipping demand as was expected. Buyers were showing a great deal of caution in making commitments and appeared unwilling to stock up in any appreciable quantity.

Ammonia Anhydrous — The firm tone which has characterized this market for a long period of time continued during the month. Practically all consumers using appreciable tonnages are booked on contract and spot sales were routine and at very firm prices.

Ammonia Aqua — In the last week or ten days of the month on this commodity showed unmistakable signs of unsettlement. In the Eastern section of the country some price shading in both carlot and less carlot quantities was reported. The tankcar price appeared to be firm.

Ammonium Sulfate — Figures for 1930, just released, show a decided drop in the production of this commodity. With the low rate of operation in the steel centers still continuing, little improvement is looked for for several months. Actual sales in January were light, but leading factors are expecting a late season and a decided rush for material when fertilizer sales exhaust the limited stocks now in the hands of dealers. A decrease of 27.4 per cent in the amount of sulfate of ammonia produced in November as compared with the same month in 1929 is indicated by the recent United States Bureau of Mines report covering by-product coke production in the United States. For the first eleven months of 1930 the decline in coke production indicated a 13.9 per cent decrease from the amount of by-product sulfate recovered in the same period of 1929.

Benzol — Leading factors announced on January 12, a reduction of 1c on both the pure and 90% grades. On January 19, a further reduction of 1c was made. Stocks are said to have been larger than current needs warranted and some reduction in the price has been expected in the trade. While the market stabilized at the 19c figure withdrawals were lower than producers anticipated.

Bleaching Powder — Material was said to be moving out at a satisfactory rate at unchanged prices. Producers have adjusted production to consumption in a rather satisfactory way and no difficult surplus is in evidence. The price situation should remain unaltered.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Aroclors, wks. lb.	.20	.40	.20	.40	.40	.20	.....	.....
Arsenic, Red. 224 lb kegs, cs. lb.	.09¾	.10	.09¾	.10	.11	.08¾	.11	.09
White, 112 lb kegs. lb.	.03¾	.04¼	.03¾	.04¼	.04¼	.03¾	.04¼	.04
Asbestine, c-1 wks. ton	.....	15.00	.....	15.00	15.00	15.00	15.00	4.75
Barium								
Barium Carbonate, 200 lb bags wks. ton	58.00	60.00	58.00	60.00	60.00	58.00	60.00	57.00
Chlorate, 112 lb kegs NY. lb.	.14	.15	.14	.15	.15	.14	.15	.14
Chloride, 600 lb bbl wks. ton	63.00	69.00	63.00	69.00	69.00	63.00	69.00	63.00
Dioxide, 88%, 690 lb drs. lb.	.12	.13	.12	.13	.13	.12	.13	.12
Hydrate, 500 lb bbls. lb.	.04½	.05½	.04¾	.05½	.05½	.04¾	.05½	.04¼
Nitrate, 700 lb casks. lb.	.07½	.08¼	.07½	.08¼	.08¼	.07½	.08½	.08
Barytes, Floated, 350 lb bbls wks. ton	23.00	24.00	23.00	24.00	24.00	23.00	24.00	23.00
Bauxite, bulk, mines. ton	5.00	8.00	5.00	8.00	8.00	5.00	8.00	5.00
Beeswax, Yellow, crude bags. lb.	.24	.31	.24	.31	.34	.24	.37	.34
Refined, cases. lb.	.....	.37	.....	.37	.38	.37	.42	.39
White, cases. lb.	.34	.36	.34	.36	.53	.34	.53	.51
Benzaldehyde, technical, 945 lb drums wks. lb.	.60	.65	.60	.65	.65	.60	.65	.60
Benzene								
Benzene, 90%, Industrial, 8000 gal tanks wks. gal.	.....	.21	.....	.21	.22	.21	.23	.23
Ind. Pure, tanks works. gal.	.....	.21	.....	.21	.22	.21	.23	.23
Benzidine Base, dry, 250 lb bbls. lb.	.65	.67	.65	.67	.74	.65	.74	.70
Benzoyl, Chloride, 500 lb drs. lb.	.45	.47	.45	.47	1.00	.45	1.00	1.00
Benzyl, Chloride, tech drs. lb.	.....	.25	.....	.25	.25	.25	.25	.25
Beta-Naphthol, 250 lb bbl wk. lb.	.22	.24	.22	.24	.24	.22	.26	.22
Naphthylamine, sublimed, 200 lb bbls. lb.	1.25	1.35	1.25	1.35	1.35	1.25	1.35	1.35
Tech, 200 lb bbls. lb.	.58	.65	.58	.65	.65	.53	.68	.60
Blanc Fixe, 400 lb bbls wks. ton	75.00	90.00	75.00	90.00	90.00	75.00	90.00	75.00
Bleaching Powder								
Bleaching Powder, 300 lb drs c-1 wks contract. 100 lb.	2.00	2.35	2.00	2.35	2.35	2.00	2.25	2.00
Blood, Dried, fob, NY. Unit	2.90	3.00	2.90	3.00	3.90	3.00	4.60	3.90
Chicago. Unit	.....	2.75	.....	2.75	4.50	2.75	5.00	4.40
S. American shipt. Unit	3.15	3.20	3.15	3.20	4.10	3.15	4.70	4.25
Blues, Bronze Chinese Milori Prussian Soluble. lb.	.....	.35	.....	.35	.35	.35	.35	.32
Bone, raw, Chicago. ton	31.00	32.00	31.00	32.00	39.00	31.00	42.00	39.00
Bone, Ash, 100 lb kegs. lb.	.06	.07	.06	.07	.07	.06	.07	.06
Black, 200 lb bbls. lb.	.05½	.08¼	.05½	.08¼	.08¼	.05½	.08¼	.08¼
Meal, 3% & 50%, Imp. ton	.....	31.00	.....	31.00	31.00	31.00	35.00	30.00
Borax, bags. lb.	.02¼	.03¼	.02½	.03¼	.03¼	02½	.03¼	.02½
Bordeaux, Mixture, 16% pwd. lb.	.11½	.13	.11½	.13	.14	.12	.14	.10½
Paste, bbls. lb.	.11½	.13	.11½	.13	.14	.12	.14	.10
Brazilwood, sticks, shpmt. lb.	26.00	28.00	26.00	28.00	28.00	26.00	28.00	26.00
Bromine, cases. lb.	.38	.45	.38	.45	.47	.38		
Bronze, Aluminum, powd blk. lb.	.60	1.20	.60	1.20	1.20	.60	1.20	.60
Gold bulk. lb.	.55	1.25	.55	1.25	1.25	.55	1.25	.55
Butyl, Acetate, normal drs. lb.	.17	.175	.17	.175	.20	.17	.195	.184
Tank, wks. lb.	.16	.175	.16	.175	.186	.16	.186	.181
Aldehyde, 50 gal drs wks. lb.	.34	.44	.34	.44	.44	.34	.70	.34
Carbitol s ee Diethylene Glycol Mono (Butyl Ether)	.....	.....	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)								
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.50	.50	.50	.50
Propionate, drs. lb.	.22	.25	.22	.25	.27	.22	.36	.25
Stearate, 50 gal drs. lb.	.25	.30	.25	.30	.30	.25	.60	.25
Tartrate, drs. lb.	.55	.60	.55	.60	.60	.55	.60	.57
Cadmium, Sulfide, boxes. lb.	.90	1.40	.90	1.40	1.75	.90	1.75	.75
Calcium								
Calcium, Acetate, 150 lb bags c-1. 100 lb.	.....	2.00	.....	2.00	4.50	2.00	4.50	4.50
Arsenate, 100 lb bbls c-1 wks. lb.	.07	.09	.07	.09	.09	.07	.09	.07
Carbide, drs. lb.	.05	.06	.05	.06	.06	.05	.06	.05
Carbonate, tech, 100 lb bags c-1. lb.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks. ton	.....	22.75	.....	22.75	22.75	22.75	25.00	22.75
Solid, 650 lb drs c-1 fob wks ton	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Nitrate, 100 lb bags. ton	40.00	43.00	40.00	43.00	43.00	40.00	52.00	42.00
Peroxide, 100 lb. drs. lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Phosphate, tech, 450 lb bbls lb.	.08	.08¼	.08	.08¼	.08¼	.08	.08	.07
Stearate, 100 lb bbls. lb.	.19	.22	.19	.22	.26	.19	.26	.25
Calurea, bags S. points. c.i.f. ton	.....	88.65	.....	88.65	88.65	88.65	88.15	82.15
Camwood, Bark, ground bbls. lb.	.....	.18	.....	.18	.18	.18	.18	.18
Candelilla Wax, bags. lb.	.14½	.15	.14½	.15	.20	.15	.24	.22
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)	.....	.....	.....	.....	.....	.....	.....	.....
Carbon, Decolorizing, 40 lb bags c-1. lb.	.08	.15	.08	.15	.15	.08	.15	.08
Black, 100-300 lb cases 1c-1 NY. lb.	.06	.12	.06	.12	.12	.06	.12	.12
Bisulfide, 500 lb drs 1c-1 NY. lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Dioxide, Liq. 20-25 lb cyl. lb.	.....	.06	.....	.06	.18	.06	.06	.06
Tetrachloride, 1400 lb drs delivered. lb.	.06½	.07	.06½	.07	.07	.06½	.07½	.06½
Carnauba Wax, Flor, bags. lb.	.26	.28	.26	.28	.37	.28	.43	.35
No. 1 Yellow, bags. lb.	.23	.24	.23	.24	.33	.25	.40	.33
No. 2 N Country, bags. lb.	.18	.20	.18	.20	.27	.20	.32	.28
No. 2 Regular, bags. lb.	.21	.23	.21	.23	.30	.23	.36	.31
No. 3 N. C. lb.	.14½	.15	.14½	.15	.23	.16	.25	.24
No. 3 Chalky. lb.	.14	.15	.14	.15	.23	.16	.26	.24
Casein, Standard, Domestic ground. lb.	.09½	.12	.09½	.12	.15½	.09½	.17	.15

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

Butyl Acetate — Spot business showed slight improvement in each succeeding week of the past month. Prices were unchanged.

Butyl Alcohol — Effective January 1, producers announced a price reduction of 1c, bringing the prices in various quantities down to the following level:— Tanks, 15¾c to 16¾c per pound; car lots, works, drums, 16¼c to 17¼c; less carlots, works, 16¾c to 17¾c; less than 50 gallons, drums, works, 20¼c. The reductions were made possible through the reduced cost of raw materials, since corn is now selling around 70 cents a bushel, compared with 90 cents a year ago.

Calcium Acetate — Leading acid producers have again entered the market with the close of the inventory period and a change for the better has been noticed in several quarters. Unwieldy stocks are still hampering the situation and it is thought little change in prices can be looked for for several months. Production of acetate of lime for ten months ended with October last amounted to 76, 510, 718 pounds, the Census Bureau reports compared with 110,598,892 pounds during the same time in 1929. Shipments for the period were 56,975,155 pounds, against 110,007,035 pounds for the corresponding period of 1929.

Casein — Prices were generally lower during the month in the face of little demand from consuming channels. The reductions of the last two months has failed to stimulate trade and the impression prevailed that the larger buyers were still out of the market.

Chlorine — Until some new uses are placed in operation involving large tonnages there is little likelihood of the situation improving to any marked degree. At the moment shipments in the last two weeks of the month were better when comparison is had with December or the first two weeks of January. The price level remained unchanged.

Copper — Sales were restricted in volume throughout the entire month with the result that the statistical position of the metal did not show any decided improvement. As the month closed, customs smelters were anxiously endeavoring to interest buyers at 9¾c but without much success. The future trend of the market depends upon what buying strength appears in the next few weeks. Without the impetus of sustained demand it is thought that the market will show fresh weakness.

Copper Sulfate — With the price of metallic copper apparently entrenched for the moment around the 10c level the price of copper sulfate appeared to be firmly established. Producers were operating at

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cellosolve (see Ethylene glycol mono ethyl ether)							
Acetate (see Ethylene glycol mono ethyl ether acetate)							
Celluloid, Scraps, Ivory cs....lb.	.....	.20	.....	.20	.20	.20	.30	.20
Shell, cases....lb.	.18	.20	.18	.20	.20	.18	.20	.18
Transparent, cases....lb.	.....	.15	.....	.15	.15	.15	.32	.15
Cellulose, Acetate, 50 lb kegs .lb.	.80	1.25	.80	1.25	1.25	.80	1.25	1.20
Chalk, dropped, 175 lb bbls...lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.03½	.02	.03½	.02
Light, 250 lb casks....lb.	.02½	.03½	.02½	.03½	.03½	.02½	.03½	.02½
Charcoal, Hardwood, lump, bulk wks....bu.	.18	.19	.18	.19	.19	.18	.19	.18
Willow, powd, 100 lb bbl wks....lb.	.06	.06½	.06	.06½	.06½	.06	.06½	.06
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.05	04	.05	.04
Chestnut, clarified bbls wks,..lb.	.02½	.03	.02½	.03	.03	.02½	.02	.03½
25% tks wks....lb.	.01¾	.02½	.01¾	.02½	.02½	.01¾	.02½	.01¾
Powd, 60%, 100 lb bgs wks..lb.	.....	.04¼	.....	.04¼	.04¼	.04¼	.04 1/8	.04¼
Powd, decolorized bgs wks..lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
China Clay, lump, blk mines.ton	8.00	9.00	8.00	9.00	9.00	8.00	9.00	8.00
Powdered, bbls....lb.	.01¾	.02	.01¾	.02	.02	.01¾	.02	.01¾
Pulverized, bbls wks....ton	10.00	12.00	10.00	12.00	12.00	10.00	12.00	10.00
Imported, lump, bulk....ton	15.00	25.00	15.00	25.00	25.00	15.00	25.00	15.00
Powdered, bbls....lb.	.01¾	.03	.01¾	.03	.03	.01¾	.03½	.01¾
Chlorine								
Chlorine, cyls 1c-1 wks contract ....lb.	.07	.08½	.07	.08½	.08½	.07	.08½	.07
cyls, cl wks,. contract ...lb.	.04	.04½	.04	.04½	.04½	.04	.04½	.04½
Liq tank or multi-car lot cyls wks contract....lb.	.01¾	.02½	.01¾	.02½	.025	.01¾	.03	.025
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks....lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.08½
Chloroform, tech, 1000 lb drs..lb.	.15	.16	.15	.16	.16	.15	.20	.16
Chloropicrin, comml cyls....lb.	1.00	1.35	1.00	1.35	1.35	1.00	1.35	1.00
Chrome, Green, CP....lb.	.26	.29	.26	.29	.29	.26	.29	.26
Commercial....lb.	.06½	.11	.06½	.11	.11	.06½	.11	.06½
Yellow....lb.	.16	.18	.16	.18	.18	.16	.18	.15
Chromium, Acetate, 8% Chrome bbls....lb.	.04½	.05½	.04¾	.05½	.05½	.04¾	.05½	.04½
20° soln, 400 lb bbls....lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	.28	.27	.28	.27
Oxide, green, bbls....lb.	.34½	.35½	.34½	.35½	.35½	.34½	.35½	.34½
Coal tar, bbls....bbl	10.00	10.50	10.00	10.50	10.50	10.00	10.50	10.00
Cobalt Oxide, black, bags....lb.	2.10	2.22	2.10	2.22	2.22	2.10	2.22	2.10
Cochineal, gray or black bag..lb.	.52	.57	.52	.57	1.01	.52	1.01	.95
Teneriffe silver, bags....lb.	.53	.54	.53	.54	.95	.54	.95	.95
Copper								
Copper, metal, electrol....100 lb.	9.75	10.00	9.75	10.00	17.78	9.50	24.00	17.00
Carbonate, 400 lb bbls....lb.	.08½	.16½	.08½	.16½	.21½	.08½	.25	.13
Chloride, 250 lb bbls....lb.	.22	.25	.22	.25	.28	.22	.28	.25
Cyanide, 100 lb drs....lb.	.41	.42	.41	.42	.45	.41	.60	.44
Oxide, red, 100 lb bbls....lb.	.15½	.18	.15½	.18	.32	.15½	.32	.16½
Sub-acetate verdigris, 400 lb bbls....lb.	.18	.19	.18	.19	.19	.18	.19	.18
Sulfate, bbls c-1 wks...100 lb.	4.00	4.70	4.00	4.70	5.50	3.95	7.00	5.50
Copperas, crys and sugar bulk c-1 wks....ton	13.00	14.00	13.00	14.00	14.00	13.00	14.00	13.00
Cotton, Soluble, wet, 100 lb bbls....lb.	.40	.42	.40	.42	.42	.40	.42	.40
Cottonseed, S. E. bulk c-1...ton	.....	26.50	.....	26.50	.....	.....	.....	.....
Meal S. E. bulk....ton	.....	.....	.....	.....	.....	.....	.....	.....
7% Amm., bags mills...ton	37.50	38.00	37.50	38.00	38.00	37.50	38.00	37.50
Cream Tartar, USP, 300 lb. bbls....lb.	.24	.24½	.24	.24½	.27	.24½	.28	26½
Creosote, USP, 42 lb cbys....lb.	.40	.42	.40	.42	.42	.40	.42	.40½
Oil, Grade 1 tanks....gal.	.13	.14	.13	.14	.16	.15	.19	.15
Grade 2....gal.	.11	.12	.11	.12	.14	.13	.23	.13
Grade 3....gal.	.11	.12	.11	.12	.14	.13	.28	.13
Cresol, USP, drums....lb.	.13	.17	.13	.17	.17	.14	.17	.14
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.36	.32	.36	.32
Cudbear, English....lb.	.16	.17	.16	.17	.17	.16	.17	.16
Cutch, Rangoon, 100 lb bales..lb.	.11	.13	.11	.13	.13	.11	.16	.12½
Borneo, Solid, 100 lb bale..lb.	.06½	08½	.06½	.08½	.08½	.06½	.08½	.08
Cyanamide, bulk c-1 wks Nitrogen unit....lb.	.....	1.70	.....	1.70	2.00	1.70	2.00	2.00
Dextrin, corn, 140 lb bags..100 lb.	4.00	4.02	4.00	4.02	4.82	4.42	4.92	4.62
White, 140 lb bags....100 lb.	4.17	4.02	4.17	4.02	4.77	4.17	4.87	4.57
Potato, Yellow, 220 lb bgs..lb.	.08	.09	.08	.09	.09	.08	.09	.08
White, 220 lb bags 1c-1....lb.	.08	.09	.08	.09	.09	.08	.09	.08
Tapioca, 200 lb bags 1c-1...lb.	.08½	.08¾	.08½	.08¾	.08½	.08	.08½	.08
Diamylphthalate, drs wks...gal.	.....	3.80	.....	3.80	3.80	3.80	3.80	3.80
Dianisidine, barrels....lb.	2.35	2.70	2.35	2.70	2.70	2.35	3.10	2.70
Dibutylphthalate, wks....lb.	.24½	.28	.24½	.28	.28	.24½	.26½	.26½
Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.29½	.31½	.31½	.29½	.31½	.29½
Dichloroethylether, 50 gal drs lb.	.....	.06	.....	.06	.07	.05	.13	.05
Dichloromethane, drs wks....lb.	.55	.65	.55	.65	.65	.55	.65	.55
Diethylamine, 400 lb drs....lb.	2.75	3.00	2.75	3.00	3.00	2.75	3.00	2.75
Diethylcarbonate, drs ....gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Diethylaniline, 850 lb drs....lb.	.55	.60	.55	.60	.60	.55	.60	.55
Diethyleneglycol, drs....lb.	.14	.16	.14	.16	.13	.10	.13	.10
Mono ethyl ether, drs...lb.	.....	.16	.....	.16	.16	.13	.15	.13
Mono butyl ether, drs...lb.	.24	.30	.24	.30	.30	.24	.30	.25
Diethylene oxide, 50 gal dr....lb.	.....	.50	.....	.50	.50	.50	.50	.50
Diethylorthotoluidin, drs....lb.	.64	.67	.64	.67	.67	.64	.67	.64
Diethyl phthalate, 1000 lb drums....lb.	.24	.26	.24	.26	.26	.24	.26	.24
Diethylsulfate, technical, 50 gal drums....lb.	.30	.35	.30	.35	.35	.30	.35	.30
Dimethylamine, 400 lb drs...lb.	.....	2.62	.....	2.62	2.62	2.62	2.62	2.62
Dimethylaniline, 340 lb drs...lb.	.26	.28	.26	.28	.28	.26	.32	.26

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Sal Soda
Monohydrate of Soda
Standard Quality

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

rather full schedules in anticipation of the spring agricultural demand which is expected will be of fair tonnage. The United States production of copper sulfate during 1929 totaled 39,594 tons valued at $4,356,246 compared with 28,334 tons valued at $2,774,400 for 1927. The United States imports for the eleven months of 1930 were 2,951 tons valued at $280,056 compared with 2,426 tons valued at $244,941 for the same period of the preceding year. The United States exports for the eleven months of 1930 declined to 2,095 tons from 2,785 tons for the same period of 1929.

Copperas — Steel production reached higher levels during the month than prevailed in December but not to such an extent as to cause any concern as to the quantity of copperas produced. Consumption is still lagging behind normal, but stocks are very low in the hands of dealers.

Cream of Tartar — The competitive situation between domestic and imported material as well as a competitive situation between domestic producers brought about a further lowering of the price structure of the domestic product on January 12. The new schedule was based on a reduction of ½c and crystals and powdered in barrels are now quoted at 24c, f.o.b. New York.

Cresols — Effective January 18, the U.S.P. variety was lowered 1c, the new price being 13c instead of 14c.

Dried Blood — The recent weakness in the price of this commodity continued throughout the month and at the close the established quotation was announced as $2.90 a unit with rumors of even better figures on tonnages of appreciable size.

Ethyl Acetate — Shipments against existing contracts were in satisfactory volume and the price situation is reported as being in a firmer position than has prevailed for several months.

Fine Chemicals — Demand for the leading medicinal chemicals continued unabated. The present wave of influenza has depleted manufactured stocks and replacement sales were heavy.

Waxes — The market generally showed no improvement during January. Japan was again lower as dealers were exerting efforts to get rid of stocks on hand.

Formaldehyde — With the turn of the year some improvement was noticeable in demand from consuming channels. The price structure has shown no appreciable change since the reduction in the fall. Exports during the eleven months ended November 30 totaled 3,562,416 pounds in 1930 as compared with 2,085,836 pounds during the corresponding time in 1929. It is thought that much of the

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.50	.45	.50	.45
Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.15½	.16½	.16½	.15½	.16½	.15
Dintrochlorobenzene, 400 lb bbls.....lb.	.13	.15	.13	.15	.15	.13	.15	.13
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.37	.34	.37	.34
Dinitrophenol, 350 lb bbls....lb.	.29	.30	.29	.30	.32	.31	.32	.31
Dinitrotoluene, 300 lb bbls...lb.	.16	.17	.16	.17	.18	.16	.19	.17
Diorthotolyguanidine, 275 lb bbls wks.....lb.	.42	.46	.42	.46	.46	.42	.49	.42
Dioxan (See Diethylene Oxide)	.....	.....	.....	.....	.....	.....	.....	.....
Diphenyl.....lb.	.20	.40	.20	.40	.50	.20	.50	.40
Diphenylamine.....lb.	.37	.38	.37	.38	.40	.38	.47	.40
Diphenylguanidine, 100 lb bbl lb.	.30	.35	.30	.35	.35	.30	.40	.30
Dip Oil, 25%, drums.....lb.	.26	.30	.26	.30	.30	.26	.30	.26
Divi Divi pods, bgs shipmt..ton	33.00	35.00	33.00	35.00	46.50	35.00	57.00	46.50
Extract.....lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Egg Yolk, 200 lb cases.....lb.	.72	.75	.72	.75	.80	.72	.84	.77
Epsom Salt, tech, 300 lb bbls c-l NY.....100 lb.	1.70	1.90	1.70	1.90	1.90	1.70	1.90	1.70
Ether, USP, 600 lb. drs.....lb.	.21	.28	.21	.28	.28	.21	.39	.38
Anhydrous, C.P. 300 lb. drs.lb.	.....	.40	.....	.40	.40	.40		
Ethyl Acetate, 85% Ester, ... tanks.....lb.	.....	.088	.....	.088	.115	.085	.122	.108
drums.....lb.	.094	.10	.094	.10	.158	.094	.129	.111
Anhydrous, tanks.....lb.	.....	.119	.....	.119	.142	.119		
drums.....lb.	.115	.121	.115	.121	.156	.115		
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.68	.65	.68	.65
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	1.11	.88	1.11	1.05
Bromide, tech, drums .....lb.	.50	.55	.50	.55	.55	.50	.55	.50
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Chloride, 200 lb. drums....lb.	.....	.22	.....	.22	.22	.22	.22	.22
Chlorocarbonate, cbys.....lb.	.....	.30	.....	.30	.40	.30	.40	.35
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.52	.50	.52	.50
Furoate, 1 lb tins .....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Lactate, drums works.....lb.	.25	.29	.25	.29	.29	.25	.35	.25
Methyl Ketone, 50 gal drs..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Oxalate, drums works.....lb.	.45	.55	.45	.55	.55	.45	.55	.45
Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.....	.30½	.30½	.30½	.36	.30
Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.....	.70	.70	.70	.70	.79
Chlorhydrin, 40%, 10 gal cbys. chloro. cont.....lb.	.75	.85	.75	.85	.85	.75	.85	.75
Dichloride, 50 gal drums...lb.	.05	.07	.05	.07	.07	.05	.10	.05
Glycol, 50 gal drs wks.....lb.	.25	.28	.25	.28	.28	.25	30	.25
Mono Butyl Ether drs wks.	.25	.27	.25	.27	.27	.23	.31	.23
Mono Ethyl Ether drs wks	.17	.20	.17	.20	.20	.16	.24	.16
Mono Ethyl Ether Acetate dr. wks.....	.19½	.23	.19½	.23	.23	.19	.26	.19
Mono Methyl Ether, drs.lb.	.21	.23	.21	.23	.23	.19	.23	.19
Oxide, cyl.....lb.	.....	2.00	.....	2.00	2.00	2.00		
Ethylidenaniline.....lb.	.45	.47½	.45	.47½	.47½	.45	.65	.45
Feldspar, bulk.....ton	15.00	20.00	15.00	20.00	25.00	15.00	25.00	20.00
Powdered, bulk works.....ton	15.00	21.00	15.00	21.00	21.00	15.00	21.00	15.00
Ferric Chloride, tech, crystal 475 lb bbls.....lb.	.05	.07½	.05	.07½	.07½	.05	.09	.05
Fish Scrap, dried, wks.....unit	.....	4.20&10	.....	4.20 & 10	4.35&10	3.90&10	4.25&10	3.65&10
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	3.50&50	.....	3.50 & 50	3.50&50	3.20&50	4.00&50	3.50&50
Fluorspar, 98%, bags.....	41.00	46.00	41.00	46.00	46.00	41.00	46.00	41.00
Formaldehyde								
Formaldehyde, aniline, 100 lb. drums.....lb.	.37½	.42	.37½	.42	.42	.37½	.42	.37
USP, 400 lb bbls wks.....lb.	.06	.07	.06	.07¼	.08	.06	.10	.08½
Fossil Flour.....lb.	.02½	.04	.02½	.04	.04	.02½	.04	.02½
Fullers Earth, bulk, mines..ton	15.00	20.00	15.00	20.00	20.00	15.00	20.00	15.00
Imp. powd c-l bags.....ton	24.00	30.00	24.00	30.00	30.00	24.00	30.00	25.00
Furfural (tech.) drums, wks..lb.	.....	.10	.....	.10	.15	.10	.19½	.17
Furfuramide (tech) 100 lb dr..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Alcohol, (tech) 100 lb dr....lb.	.....	.50	.....	.50	.50	.50	.50	.50
Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.....	.50	.50	.50	1.00	.50
Fusel Oil, 10% impurities ...gal.	.. ..	1.35	.....	1.35	1.35	1.35	1.35	1.35
Fustic, chips.....lb.	.04	.05	.04	.05	.05	.04	.05	.04
Crystals, 100 lb boxes.....lb.	.20	.22	.20	.22	.22	.20	.22	.20
Liquid, 50°, 600 lb bbls....lb.	.09	10	.09	.10	.10	.09	.10	.09
Solid, 50 lb boxes.....lb.	.14	.16	.14	.16	.16	.14	.16	.14
Sticks.....ton	25.00	26.00	25.00	26.00	26.00	25.00	26.00	25.00
G Salt paste, 360 lb bbls.....lb.	.45	.50	.45	.50	.50	.45	.52	.45
Gall Extract.....lb.	.18	.20	.18	.20	.20	.18	.21	.18
Gambier, common 200 lb cs...lb.	.06½	.07	.06½	.07	.07	.06	.07	06
25% liquid, 450 lb bbls....lb.	.08	.10	.08	.10	.10	.08	.14	.08
Singapore cubes, 150 lb bg..lb.	.09½	.09	.09½	.09	.09	.08½	.09	.08½
Gelatin, tech, 100 lb cases....lb.	.45	.50	.45	.50	.50	.45	.50	.45
Glauber's Salt, tech, c-l wks.....100 lb.	1.00	1.70	1.00	1.70	1.70	1.00	1.70	.70
Glucose (grape sugar) dry 70-80° bags c-l NY.....100 lb.	3.24	3.34	3.24	3.34	3.34	3.24	3.34	3.20
Tanner's Special, 100 lb bags .....100 lb.	.....	3.14	.....	3.14	3.14	3.14	3.14	3.14
Glue, medium white, bbls ...lb.	.22	.24	.22	.24	.24	.20	.24	.20
Pure white, bbls.. .....lb.	.25	.26	.25	.26	.26	.22	.26	.22
Glycerin, CP, 550 lb drs.....lb.	.12½	.14½	.12½	.14½	.14½	.12½	.16	.13½
Dynamite, 100 lb drs..... lb.	.10½	.12¼	.10½	.12¼	.12¼	.11	.12¼	.10½
Saponification, tanks.....lb.	.07½	.08	.07½	.08	.08	.07½	.08¼	.07¼
Soap Lye, tanks.....lb.	.06½	.07	.06¼	.07	.07½	.06¼	.07¼	.06¼
Graphite, crude, 220 lb bgs...ton	15.00	35.00	15.00	35.00	35.00	15.00	35.00	15.00
Flake, 500 lb bbls.....ib.	.06	09	.06	.09	.09	.06	.09	06
Gums								
Gum Accroides, Red, coarse and fine 140-150 lb bags.....lb.	.03¼	.04½	.03¼	.04½	.04½	.03¼	.04½	.03
Powd, 150 lb bags.....lb.	.06	.06½	.06	.06½	.06½	.06	.06½	.06½

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

business was written at rather low prices due to competition.

Glycerine — The tone of the market in this commodity was distinctly unsettled during the month in spite of a slight improvement in inquiry and demand from the larger consumers. Stocks are large and the mild state of the weather generally throughout the country has failed to assimilate the quantities expected. The present market is based on dynamite, 10½-11c, saponification, 7¾c, soap lye, 6¾-7c.

Greases — While the general trend of the market has been towards lower levels in the past few months prices in January showed definite indication of strengthening. Consumers were entering the market in greater numbers and any further price changes are expected to be in the opposite direction.

Gums — The position of the gum market showed little change in the first month of the year. The demand for small deliveries out of local stocks was somewhat better, but large size business was lacking and, consequently, the price situation showed no tendency to strengthen. The Dammars and Kauri were exceptions to the rule and prices in these grades were firmly held and shipments were fairly large.

Intermediates — With the introduction of the lighter shades in the textile and tanning trades better demand for several of the leading intermediates was confidently looked for. The price situation remained unchanged. Imports of synthetic dyes dropped tremendously last year, as 1930 imports totaled 4,113,974 pounds valued at $3,499,551 as compared with 1929 imports of 6,401,408 pounds valued at $5,359,784. Imports of synthetic dyes in December amounted to 306,318 pounds valued at $263,072, as compared with imports during December, a year ago, of 534,686 pounds with a value of $457,511.

Comparison of Imports

	December 1930	December 1929
Germany	78.00	72.96
Switzerland	18.47	24.58
England	3.53	2.79
All other	...	1.67

Lead — The year-end statistics indicated increasing stocks of the metal, but these figures were evidently discounted in December as the price range fluctuated in a very narrow range during the month in the face of light trading.

Lead, Red — Both red lead and litharge were reduced ½c to bring these chemicals more nearly in line with the lead metal market. Some improvement was re-

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Yellow, 150-200 lb bags....lb.	.18	.20	.18	.20	.20	.18	.20	.18
Animi (Zanzibar) bean & pea 250 lb cases....lb.	.35	.40	.35	.40	.40	.35	.40	.35
Glassy, 250 lb cases....lb.	.50	.55	.50	.55	.55	.50	.55	.50
Asphaltum, Barbadoes (Manjak) 200 lb bags....lb.	.09	.12	.09	.12	.12	.09	.12	.09
Egyptian, 200 lb cases....lb.	.15	.17	.15	.17	.17	.15	.17	.15
Gilsonite Selects, 200 lb bags ....ton	58.00	65.00	58.00	65.00	65.00	58.00	65.00	58.00
Damar Batavia standard 136, lb cases....lb.	.12½	.13	.12½	.13	.20	.14	.26	.22
Batavia Dust, 160 lb bags....lb.	.05½	.06	.05½	.06	.11	.06	.11	.10½
E Seeds, 136 lb cases....lb.	.07½	.08	.07½	.08	.13	.08	.17½	.15
F Splinters, 136 lb cases and bags....lb.	.07	.07½	.07	.07½	.13½	.07	.13½	.13
Singapore, No 1, 224 lb cases lb.	.14½	.15	.14½	.15	.24	.18½	.30½	.26
No. 2, 224 lb cases....lb.	.09½	.10	.09½	.10	.20½	.13	.24	.21½
No. 3, 180 lb bags....lb.	.05½	.06	.05½	.06	.11½	.07	.14	.10
Benzoin Sumatra, U. S. P. 120 lb cases....lb.	.33	.34	.33	.34	.40	.33	.40	.38
Copal Congo, 112 lb bags, clean opaque....lb.	.16	.17	.16	.17	.17	.16	.17	.14
Dark, amber....lb.	.07	.07½	.07	.07½	.08	.07½	.09	.08½
Light, amber....lb.	.12½	.14	.12½	.14	.14	.12½	.14	.12½
Water white....lb.	.37	.45	.37	.45	.45	.37	.36	.35
Mastic....lb.	.57	.58	.57	.58	.65	.57	.65	.58
Manila, 180-190 lb baskets								
Loba A....lb.	.12	.13	.12	.13	.17½	.13	.17½	.17
Loba B....lb.	.10	.10½	.10	.10½	.16½	.13½	.16½	.15½
Loba C....lb.	.09½	.10	.09½	.10	.14	.10	.14½	.13½
M A Sorts....lb.	.06	.06½	.06	.06½	.....	.....	.....	.....
D B B Chips....lb.	.07½	.08	.07½	.08	.....	.....	.....	.....
East Indies chips, 180 lb bags lb.	.05	.05½	.05	.05½	.11	.09	.11	.10
Pale bold, 224 lb cs....lb.	.15½	.16	.15½	.16	.21	.17½	.21	.20
Pale nubs, 180 lb bags....lb.	.08½	.09	.08½	.09	.16	.12½	.16	15
Pontianak, 224 lb cases....								
Bold gen No 1....lb.	.16	.17	.16	.17	.21	.19	.23	.20
Gen chips spot....lb.	.08	.08½	.08	.08½	.15	.13½	.15	.14½
Elemi, No. 1, 80-85 lb cs...lb.	.11½	.12	.11½	.12	.14	.12½	.14	.13½
No. 2, 80-85 lb cases....lb.	.11	.11½	.11	.11½	.13½	.12	.13½	.13
No. 3, 80-85 lb cases....lb.	.10	.11	.10	.11	.13	.11	.13	.12
Kauri, 224-226 lb cases No. 1	.44	.50	.44	.50	.57	.48	.57	.50
No. 2 fair pale....lb.	.28	.29	.28	.29	.38	.32	.38	.35
Brown Chips, 224-226 lb cases....lb.	.10	.12	.10	.12	.12	.10	.12	.10
Bush Chips, 224-226 lb. cases....lb.	.32	.34	.32	.34	.40	.38	.40	.38
Pale Chips, 224-226 lb cases ....lb.	.20	.22	.20	.22	.26	.24½	.26	.24½
Sandarac, prime quality, 200 lb bags & 300 lb casks...lb.	.19	.22	.19	.22	.40	.27	.72	.35
Helium, 1 lit. bot. ....lit.	.....	25.00	.....	25.00	25.00	25.00	.20	.17
Hematine crystals, 400 lb bbls lb.	.14	.18	.14	.18	.18	.14	.20	.14
Paste, 500 bbls....lb.	.....	.11	.....	.11	.11	.11	.11	.11
Hemlock 25%, 600 lb bbls wks lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Bark....ton	.....	16.00	.....	16.00	16.00	16.00	17.00	16.00
Hexalene, 50 gal drs wks....lb.	.....	.60	.....	.60	.60	.60	.60	.60
Hexamethylenetetramine, drs lb.	.46	.50	.46	.50	.50	.46	.58	.48
Hoof Meal, fob Chicago....unit	.....	2.50	.....	2.50	3.75	2.50	4.00	3.75
South Amer. to arrive....unit	.....	2.70	.....	2.70	3.75	2.70	3.90	3.75
Hydrogen Peroxide, 100 vol, 140 lb cbys....lb.	.21	.24	.21	.24	.26	.21	.26	.24
Hydroxyamine Hydrochloride lb.	.....	3.15	.....	3.15	3.15	3.15		
Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.12	.15	.15	.12	.15	.12
Indigo Madras, bbls....lb.	1.28	1.30	1.28	1.30	1.30	1.28	1.30	1.28
20% paste, drums....lb.	.15	.18	.15	.18	.18	.15	.18	.15
Synthetic, liquid....lb.	.....	.12	.....	.12	.12	.12	.12	.12
Iron Chloride, see Ferric or Ferrous								
Iron Nitrate, kegs....lb.	.09	.10	.09	.10	.10	.09	.10	.09
Coml, bbls....100 lb.	2.50	3.25	2.50	3.25	3.25	2.50	3.25	2.50
Oxide, English....lb.	.10	.12	.10	.12	.12	.10	.12	.10
Red, Spanish....lb.	.02½	.03½	.02½	.03½	.03½	.02½	.03½	.02½
Isopropyl Acetate, 50 gal drs gal.	.85	.90	.85	.90	.90	.85	.90	.85
Japan Wax, 224 lb cases....lb.	.10½	.11	.10½	.11	.15½	.11½	.18	.16
Kieselguhr, 95 lb bgs NY.... Brown....ton	60.00	70.00	60.00	70.00	70.00	60.00	70.00	60.00
Lead Acetate, bbls wks...100 lb.	10.50	11.00	10.50	11.00	13.50	10.50	13.50	13.00
White crystals, 500 lb bbls wks....100 lb.	12.00	12.25	12.00	12.25	14.50	11.50	14.50	14.00
Arsenate, drs 1c-1 wks....lb.	.13	.16	.13	.16	.16	.13	.15	.13
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1.00		
Metal, c-1 NY....100 lb.	4.25	4.50	4.75	4.50	7.75	5.10	7.75	6.10
Nitrate, 500 lb bbls wks....lb.	.13	.14	.13	.14	.14	.13	.14	.14
Oleate, bbls....lb.	.17½	.18	.17½	.18	.18	.17½	.18	.17½
Oxide Litharge, 500 lb bbls.lb.	.07½	.08	.07½	.08	.08½	.08½	.08½	.08½
Red, 500 lb bbls wks....lb.	.07½	.08½	.07½	.08½	.09½	.08½	.09½	.09½
White, 500 lb bbls wks...lb.	.07½	.08	.07½	.08	.09½	.07½	.09½	.09
Sulfate, 500 lb bbls wk...lb.	.06½	.07	.06½	.07	.08½	.06½	.08½	.08½
Leuna saltpetre, bags c.i.f...ton	.....	57.60	.....	57.60	57.60	57.60	57.00	52.00
S. points c. i. f....ton	.....	57.90	.....	57.90	57.90	57.90	57.30	52.30
Lime, ground stone bags....ton	.....	4.50	.....	4.50	4.50	4.50	4.50	4.50
Live, 325 lb bbls wks...100 lb.	.....	1.05	.....	1.05	1.05	1.05	1.05	1.05
Lime Salts, see Calcium Salts								
Lime-Sulfur soln bbls....gal.	.15	.17	.15	.17	.17	.15	.17	.15
Lithopone, 400 lb bbls 1c-1 wks ....lb.	.04½	.05	.04½	.05	.05½	.04½	.06½	.05½
Logwood, 51°, 600 lb bbls....lb.	.07	.08	.07	.08	.08½	.07	.08½	.08½
Chips, 150 lb bags....lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Solid, 50 lb boxes....lb.	.12	.12½	.12	.12½	.12½	.12½	.12½	.12½
Sticks....ton	24.00	26.00	24.00	26.00	26.00	24.00	26.00	24.00
Lower grades....lb.	.07½	.08	.07½	.08	.08	.07½	.08	.07½
Madder, Dutch....lb.	.22	.25	.22	.25	.25	.22	.25	.22
Magnesite, calc, 500 lb bbl...ton	50.00	60.00	50.00	60.00	60.00	50.00	60.00	50.00

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Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

ported in paint circles and the usual better demand is expected in the next six months.

Lithopone — Sales and contract deliveries to the paint and linoleum industries were decidedly improved in the closing week of the month. Prices are unchanged from the 4½c level in carlots.

Methanol — Producers and consumers alike were marking time pending further developments in the denaturing situation. Prices remained unchanged from the previously quoted levels. October production of refined methanol included 647,711 gallons from wood distillation and 1,349,718 gallons of synthetic, against 404,505 gallons from wood distillation and 978,302 gallons synthetic in September, according to figures just compiled by the United States Census Bureau. Stocks of refined methanol on hand at the end of the month included 431,210 gallons from wood distillation and 347,205 gallons of synthetic, against 421,306 gallons and 1,319,225 gallons, respectively, at the end of September. Production of crude methanol in October totaled 413,451 gallons, against 328,002 gallons in the preceding month and the output of acetate of lime is placed at 6,824,209 pounds, against 6,844,662 pounds in September. Production of synthetic methanol for the period January-October, 1930, totaled 6,677,378 gallons. Shipments amounted to 6,882,451 gallons. Shipments of refined methanol during the ten months mentioned totaled 4,426,029 gallons, as compared with 5,202,384 gallons for the corresponding time in 1929.

Nickel Salts — Both the single and double salts were in better demand as the plating industry showed definite signs of betterment. Buyers of sizable quantities have contracted at the lower levels established late last fall. Shipments to the Detroit area were in large quantities.

Rosins — Little change occurred during the month in the general situation in the rosin market. The demand still affects any effort to raise the prices. In the closing days of the month grade B showed rather strong tendencies in the local market. Very little change is expected in the near future as buyers and sellers are still far apart in their views on prices prevailing for future commitments. December production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand December 31, 1930, according to information from a leading producer were as follows:—

	Production		
	Rosin, 500-lb. barrels	*Gallons Turpentine*	*Pine oil*
Month of December, 1930	34,332	309,992	229,737
Total from April 1, 1930	348,553	3,011,754	2,116,488

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Magnesium							
Magnesium Carb, tech, 70 lb bags NY lb.	.06	.06½	.06	.06½	.06½	.06	.06½ .06
Chloride flake, 375 lb. drs c-l wks ton	.....	36.00	.....	36.00	36.00	36.00	36.00 36.00
Imported shipment ton	31.75	33.00	31.75	33.00	33.00	31.75	33.00 33.00
Fused, imp, 900 lb bbls NY ton	.....	31.00	.....	31.00	31.00	31.00	31.00 31.00
Fluosilicate, crys, 400 lb bbls wks lb.	.10	.10½	.10	.10½	.10½	.10	.10½ .10
Oxide, USP, light, 100 lb bbls lb.	.....	.42	.....	.42	.42	.42	.42 .42
Heavy, 250 lb bbls lb.	.....	.50	.....	.50	.50	.50	.50 .50
Peroxide, 100 lb cs lb.	1.00	1.25	1.00	1.25	1.25	1.00	1.25 1.00
Silicofluoride, bbls lb.	.09½	.10½	.09½	.10½	.10½	.09½	.10½ .09½
Stearate, bbls lb.	.25	.26	.25	.26	.26	.25	.26 .25
Manganese Borate, 30%, 200 lb bbls lb.	.....	.19	.....	.19	.19	.19	.24 .19
Chloride, 600 lb casks lb.	.07½	.08½	.07½	.08½	.08½	.07½	.08½ .08
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.06	.03½	.06 .04½
Ore, Powdered or granular..							
75-80%, bbls lb.	.02½	.03	.02½	.03	.03	.02½	.03½ .02½
80-85%, bbls lb.	.....	.03½	.....	.03½	.03½	.03½	.04½ .03½
85-88%, bbls lb.	.04	.04½	.04	.04½	.04	.04	.05½ .04
Sulfate, 550 lb drs NY lb.	.07	.08	.07	.08	.08	.07	.08½ .07
Mangrove 55%, 400 lb bbls.. lb.	.03½	Nom.	.03½	Nom.	Nom.	.03½	Nom. .03½
Bark, African ton	.....	29.75	.....	29.75	33.00	29.75	35.00 30.00
Marble Flour, bulk ton	14.00	15.00	14.00	15.00	15.00	14.00	15.00 14.00
Mercurous chloride lb.	.....	2.05	.....	2.05	2.05	2.05	2.05 2.05
Mercury metal 75 lb flask	106.00	112.50	106.00	112.50	124.50	106.00	126.00 120.00
Meta-nitro-aniline lb.	.67	.69	.67	.69	.69	.67	.74 .67
Meta-nitro-para-toluidine 200 lb. bbls lb.	1.50	1.55	1.50	1.55	1.55	1.50	1.55 1.50
Meta-phenylene-diamine 300 lb. bbls lb.	.80	.84	.80	.84	.84	.80	.90 .80
Meta-toluene-diamine, 300 lb bbls lb.	.67	.69	.67	.69	.69	.67	.72 .67
Methanol							
Methanol, (Wood Alcohol),....							
95% gal.	.35	.37	.35	.37	.48	.35	.65 .51
97% gal.	.39	.43	.39	.43	.49	.39	.65 .53
Pure, Synthetic drums cars gal.	.....	.42½	.....	.42½	.50	.42½	.68 .53
Synthetic tanks gal.	.....	.40½	.....	.40½	.50	.40½	.66 .54
Methyl Acetate, drums gal.	.....	Nom.	.....	Nom.	Nom.	Nom.	.95 .95
Acetone, gal.	.62	.70	.62	.70	.77	.65	.85 .73
Anthraquinone, lb.	.85	.95	.85	.95	.85	.70	.95 .85
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....	.....	.....	....
Chloride, 90 lb cyl lb.	.45	.45	.45	.45	.45	.45	.60 .45
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.50	.50	.50 .50
Mica, dry grd. bags wks lb.	65.00	80.00	65.00	80.00	80.00	65.00	80.00 65.00
Wet, ground, bags wks lb.	110.00	115.00	110.00	115.00	115.00	110.00	115.00 110.00
Michler's Ketone, kegs lb.	.....	3.00	.....	3.00	3.00	3.00	3.00 3.00
Monochlorobenzene, drums see, Chorobenzene, mono lb.							
Monoethylorthotoluidin, drs. lb.	.70	.75	.70	.75	.75	.70	.75 .70
Monomethylparaminosufate 100 lb drums lb.	3.75	4.00	3.75	4.00	4.00	3.75	4.20 3.75
Montan Wax, crude, bags lb.	.06	.07	.06	.07	.07	.06	.07 .06½
Myrobalans 25%, liq bbls b	.03½	.04½	.03¾	.04¼	.04½	.03¾	.04½ .03½
50% Solid, 50 lb boxes lb.	.05	.05½	.05	.05½	.05½	.05	.08½ .05
J1 bags ton	34.00	35.00	34.00	35.00	41.00	34.00	43.00 40.00
J 2 bags ton	19.75	22.50	19.75	22.50	26.50	19.75	40.00 26.50
R 2 bags ton	19.00	20.00	19.00	20.00	27.50	19.00	34.00 27.50
Naphtha, v. m. & p. (deodorized) bbls gal.	.17	.18	.17	.18	.16	.16	.18 .16
Naphthalene balls, 250 lb bbls wks lb.	.03½	.04¾	.03¾	.04¾	.05½	.03¾	.05½ .05½
Crushed, chipped bgs wks. lb.	.....	.04	.....	.04	.04½	.04	.04½ .04½
Flakes, 175 lb bbls wks lb.	.....	.03¾	.....	.03¾	.05	.03¾	.05 .05
Nickel Chloride, bbls kegs lb.	.20	.21	.20	.21	.21	.20	.24 .20
Oxide, 100 lb kegs NY lb.	.37	.40	.37	.40	.40	.37	.40 .37
Salt bbl. 400 bbls lb NY lb.	.10½	.13	.10½	.13	.13	.10½	.13 .13
Single, 400 lb bbls NY lb.	.10½	.12	.10½	.12	.13	.10½	.13 .13
Nicotine, free 40%, 8 lb tins, cases lb.	1.25	1.30	1.25	1.30	1.30	1.25	1.30 1.25
Sulfate, 10 lb tins lb.	.98½	1.20	.98½	1.20	1.20	.98½	1.20 .98½
Nitre Cake, bulk ton	12.00	14.00	12.00	14.00	18.00	12.00	18.00 12.00
Nitrobenzene, redistilled, 1000 lb drs wks lb.	.09	.09½	.09	.09½	.09½	.09	.10½ .09
Nitrocellulose, c-l-l-cl, wks. lb.	.25	.36	.25	.36	.36	.25	.36 .25
Nitrogenous Material, bulk. unit	2.50	2.70	2.50	2.70	3.40	2.50	4.00 3.40
Nitronaphthalene, 550 lb bbls lb.	.....	.25	.....	.25	.25	.25	.25 .25
Nitrotoluene, 1000 lb drs wks. lb.	.14	.15	.14	.15	.15	.14	.15 .14
Nutgalls Aleppy, bags lb.	.16	.16½	.16	.16½	.16½	.16	.16½ .16
Chinese, bags lb.	.12	.13	.12	.13	.13	.12	.13 .12
Oak Bark, ground ton	30.00	35.00	30.00	35.00	35.00	30.00	50.00 30.00
Whole ton	20.00	23.00	20.00	23.00	23.00	20.00	23.00 20.00
Orange-Mineral, 1100 lb casks NY lb.	.11¼	.13	11¾	.13	.13	.11¼	.13¼ .11¾
Orthoaminophenol, 50 lb kgs. lb.	2.15	2.25	2.15	2.25	2.25	2.15	2.25 2.15
Orthoanisidine, 100 lb drs lb.	2.50	2.60	2.50	2.60	2.60	2.50	2.60 2.50
Orthochlorophenol, drums lb.	.50	.65	.50	.65	.65	.50	.65 .50
Orthocresol, drums lb.	.25	.25	.25	.25	.35	.18	.28 .18
Orthodichlorobenzene, 1000 lb drums lb.	.07	.10	.07	.10	.10	.07	.10 .07
Orthonitrochlorobenzene, 1200 lb drs wks lb.	.30	.33	.30	.33	.33	.30	.33 .30
Orthonitrotoluene, 1000 lb drs wk lb.	.16	.18	.16	.18	.18	.16	.18 .16
Orthonitrophenol, 350 lb dr. lb.	.85	.90	.85	.90	.90	.85	.90 .85
Orthotoluidine, 350 lb bbl lc-l lb.	.25	30	.25	.30	.30	.25	.30 .25

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

Stocks at Plants

	Rosin, 500-lb. barrels	*Gallons Turpentine*	*Pine oil*
Total December 31, 1930	123,318	789,925	1,798,816
Total March 31, 1930	91,496	706,277	1,211,826
Change	+30,822	+83,648	+586,990

Potassium Bichromate — Tanners were not increasing production schedules as rapidly as was hoped for. This situation is thought to be temporary and further improvement in the tonnages is expected in the near future.

Potassium Carbonate — Trading broadened out considerably with the end of the inventory period. Both domestic producers and importers showed signs of being satisfied with the progress made. Prices remained unchanged.

Potash Caustic — Tonnage sold by both domestic producers and the leading importers of foreign material showed satisfactory increases from the extremely low figures of December. Prices remained firm and unchanged during the month.

Potashes — While sales were limited the market remained in a very firm position. No change in the price situation is looked for and with the fertilizer season but a few weeks away considerable improvement in tonnage is expected by producers and importers. The United States imports of fertilizer potash, supplied chiefly by Germany and France, have increased steadily in recent years. The gross tonnage for 1930 exceeded 1926 by a small margin but a closer analysis reveals that there have been substantial gains in the tonnage of high grade salts and a loss of kainite.

	1929 Long tons	11 Mos. 1930 Long tons
Chloride, crude	230,966	263,944
Sulfate, crude	79,510	80,720
Kainite	75,930	107,711
Manure salts, double manure salts, and hard salts	390,828	355,645

Sal Soda — Sales in the routine channels were satisfactory. With the present price at a extremely low figure, little change is anticipated in the underlying situation.

Shellac — The downward movement seemed to have been checked in the last month both in the local and in the primary markets. At least the decline was not as large as has been the case for several months previously. Both superfine and T.N. were 1c lower during the month but other grades held quite firmly. Factors in this country were of the opinion that the market would more than likely hold at present levels. Any movement would be in the upward direction as buyers were holding small stocks in inventory and any

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Orthonitroparachlorphenol, tins lb.	.70	.75	.70	.75	.75	.70	.75	.70
Osage Orange, crystals lb.	.16	.17	.16	.17	.17	.16	.17	.16
51 deg. liquid lb.	.07	.07½	.07	.07½	.07½	.07	.07½	.07
Powdered, 100 lb bags lb.	.14½	.15	.14½	.15	.15	.14½	.15	.14½
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P. lb.	.03½	.03	.03½	.03	.04½	.03½	.06½	.04½
128-132 deg. M. P. lb.	.03½	.03½	.03½	.03½	.06½	.03½	.07	.04½
133-137 deg. M. P. lb	.04½	.07½	.04½	.07½	.07½	.04½	.07½	.06½
Para Aldehyde, 110-55 gal drs. lb.	.20½	.23	.20½	.23	.23	.20½	.28	.20½
Aminoacetanilid, 100 lb bg. lb.	.52	.60	.52	.60	1.05	.52	1.05	1.00
Aminohydrochloride, 100 lb kegs lb	1.25	1.30	1.25	1.30	1.30	1.25	1.30	1.25
Aminophenol, 100 lb keg. lb.	.84	.86	.84	.86	1.02	.92	1.15	.99
Chlorophenol, drums lb.	.50	.65	.50	.65	.65	.50	.65	.50
Coumarone, 330 lb drums. lb.	.....	.....	.....	.....	.....	.....	.....	.....
Cymene, refd, 110 gal dr. gal.	2.25	2.50	2.25	2.50	2.50	2.25	2.50	2.25
Dichlorobenzene, 150 lb bbls wks lb.	.17	.20	.17	.20	.20	.17	.20	.17
Nitroacetanilid, 300 lb bbls. lb.	.50	.55	.50	.55	.55	.50	.55	.50
Nitroaniline, 300 lb bbls wks lb.	.48	.55	.48	.55	.55	.48	.55	.48
Nitrochlorobenzene, 1200 lb drs wks lb.	.23	.26	.23	.26	.26	.23	.26	23
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.85	2.75	2.85	2.75
Nitrophenol 185 lb bbls. lb.	.45	50	.45	.50	.50	.45	.55	.45
Nitrosodimethylaniline, 120 lb. bbls lb.	.92	.94	.92	.94	.94	.92	.94	.92
Nitrotoluene, 350 lb bbls. lb.	.29	.31	.29	.31	.31	.29	.31	.29
Phenylenediamine, 350 lb bbls lb.	1.15	1.20	1.15	1.20	1.20	1.15	1.20	1.15
Toluenesulfonamide, 175 lb bbls lb.	.70	.75	.70	.75	.75	.70	.75	.70
Toluenesulfonchloride, 410 lb bbls wks lb.	.20	.22	.20	.22	.22	.20	.22	.20
Toluidine, 350 lb bbls wk. lb.	.....	.44	.....	.44	.40	.38	.42	.38
Paris Green, Arsenic Basis 100 lb kegs lb.	.....	.27	.....	.27	.27	.27	.27	25
250 lb kegs lb.	.....	.25	.....	.25	.25	.25	.25	.23
Persian Berry Ext., bbls. lb.	.25	Nom.	.25	Nom.	Nom.	.25	25	.25
Pentasol (see Alcohol, Amyl)								
Pentasol Acetate (see Amyl Acetate)								
Petrolatum, Green, 300 lb bbl. lb.	.02	.02½	.02	.02½	.02½	.02	.02½	.02
Phenol, 250-100 lb drums lb.	.14½	.15	.14½	.15	.15	.14½	.16	.13
Phenyl-Alpha-Naphthylamine, 100 lb kegs lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Phenylhydrazine Hydrochloride lb.	2.90	3.00	2.90	3.00	3.00	2.90		
Phosphate								
Phosphate Acid (see Superphosphate)								
Phosphate Rock, f.o.b. mines Florida Pebble, 68% basis. ton	3.10	3.25	3.10	3.25	3.15	3.00	3.15	3.00
70% basis ton	3.75	3.90	3.75	3.90	4.00	3.75	4.00	3.50
72% basis ton	4.25	4.35	4.25	4.35	4.50	4.25	4.50	4.00
75-74% basis ton	5.25	5.50	5.25	5.50	5.50	5.25	5.50	5.00
75% basis ton	.....	5.75	.....	5.75	5.75	5.75	5.75	5.75
77-80% basis ton	.....	6.25	.....	6.25	6.25	6.25	6.25	6.25
Tennessee, 72% basis ton	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Phosphorous Oxychloride 175 lb cyl lb.	.18	.20	.18	.20	.25	.18	.40	.20
Red, 110 lb cases lb.	.37½	.42	.37½	.42	.42	.37½	.60	.37½
Yellow, 110 lb cases wks. lb.	.31	.37½	.31	.37½	.37½	.31	.32	.31
Sesquisulfide, 100 lb cs. lb.	.....	.44	.....	.44	.44	.44	.46	.44
Trichloride, cylinders lb.	.18	.20	.18	.20	.25	.18	.35	.20
Phthalic Anhydride, 100 lb bbls wks lb.	.15	.16	.15	.16	.20	.15	.20	.18
Pigments Metallic, Red or brown bags, bbls, Pa. wks. ton	37.00	45.00	37.00	45.00	45.00	37.00	45.00	37.00
Pine Oil, 55 gal drums or bbls Destructive dist. lb.	.63	.64	.63	.64	.64	.63	.64	.63
Prime bbls. bbl.	8.00	10.60	8.00	10.60	10.60	8.00	10.60	8.00
Steam dist. bbls. gal.	.65	.70	.65	.70	.70	.65	.70	.65
Pitch Hardwood, wks. ton	35.00	45.00	35.00	45.00	45.00	35.00	45.00	40.00
Plaster Paris, tech, 250 lb bbls bbl.	3.30	3.50	3.30	3.50	3.50	3.30	3.50	3.30
Potash								
Potash, Caustic, wks, solid lb.	.06½	.06½	.06½	.06½	.06½	.06½	.07½	.06½
flake lb.	.0705	08	.0705	.08	.08	.0705	.07½	.0705
Potash Salts, Rough Kainit 12.4% basis bulk ton	.....	9.20	.....	9.20	9.20	9.10	9.10	9.00
14% basis ton	.....	9.70	.....	9.70	9.70	9.60	9.60	9.50
Manure Salts								
20% basis bulk ton	.....	12.65	.....	12.65	12.65	12.50	12.50	12.40
30% basis bulk ton	.....	19.15	.....	19.15	19.15	18.95	18.95	18.75
Potassium Acetate lb.	.28	.30	.28	.30	.30	.27		
Potassium Muriate, 80% basis bags ton	.....	37.15	.....	37.15	37.15	36.75	36.75	36.40
Pot. & Mag. Sulfate, 48% basis bags ton	.....	27.80	.....	27.80	27.80	27.50	27.50	27.00
Potassium Sulfate, 90% basis bags ton	.....	48.25	.....	48.25	48.25	47.75	47.75	47.30
Potassium Bicarbonate, USP, 320 lb bbls lb.	.09½	.10	.09½	.10	.10	.09½	.14	.09½
Bichromate Crystals, 725 lb casks lb.	.08¾	.09½	.08¾	.09½	.09½	.08¾	.09½	.09
Powd., 725 lb cks wks. lb.	.13	.13½	.13	.13½	.13½	.13	.13½	.13

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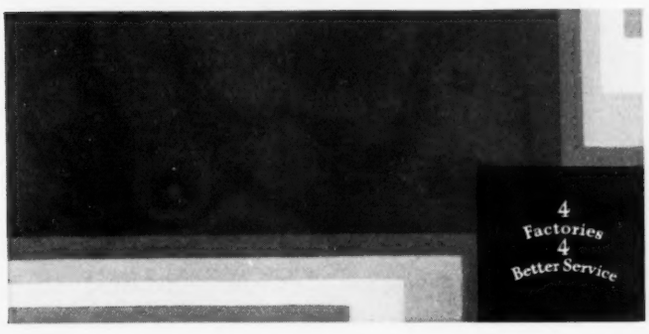

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

increase in business would reflect itself in larger purchases.

Sodium Acetate — With demand still restricted, manufacturers were offering material at 4½c, representing a decline of ½c from the former published schedule.

Soda Ash — The highly competitive situation of the past eight or ten weeks appeared to be mostly over. Prices in most quarters were stabilized at the new figures and leading producers during the month announced revised price lists on less carlot deliveries in the different sections of the country. According to the U. S. Census of Manufacturers the total production of soda ash in United States during 1929 totaled 2,682,216 tons.

Sodium Bichromate — Tonnages moving out into the tanning trade have not shown the increase that was expected to occur with the turn of the year and the end of the inventory period. Material entering the other consuming fields was in better volume. The price situation remained unchanged.

Soda Caustic — This commodity in sympathy with the improved situation in soda ash showed definite signs of stability for the first time in two months. While very little contract business remained unsigned what was left was placed at higher figures and less carlot quantities were moving out into the trade at the new prices. Total caustic soda production, in 1929 exclusive of the material made and consumed in the wood pulp and textile industries, amounted to 758,800 tons according United States Census of Manufacturers.

Sodium Chlorate — Several large buyers were reported to be negotiating on spring orders for the agricultural field and this tended to correct somewhat the dull condition existing in the market for this commodity for several months. Quotations were unaltered throughout the month.

Sodium Nitrate — With new buying strength in evidence in southern localities producers and importers were in a better frame of mind although locally the markets were still marking time. The next few weeks are expected to show much greater improvement but the bulk of the fertilizer buying is expected to be late.

Sodium Phosphate — While open quotations remain unchanged on the disalt the competitive position has caused unsettlement on prices and large size orders were being negotiated at concessions. A slight change for the better was in evidence in the silk dyeing centers. Sales of the tri-salt were better during the past month than they have been in some time but little improvement was in evi-

	Current Market		1931		1930		1929	
			Low	High	High	Low	High	Low
Binoxiate, 300 lb bbls.....lb.	.14	.17	.14	.17	.17	.14	.17	.14
Bisulfate, 100 lb kegs.....lb.	.....	.30	.....	.30	.30	.30	.30	.30
Carbonate, 80-85% calc. 800 lb casks.....lb.	.05¾	.05¾	.05¾	.05¾	.05¾	.05¾	.05¾	.05¾
Chlorate crystals, powder 112 lb keg wks.....lb.	.08	.08½	.08	.08½	.09	.08	.09	.08½
Chloride, crys bbls.....lb.	.05½	.06	.05½	.06	.06	.05½	.05½	.05¼
Chromate, kegs.....lb.	.23	.28	.23	.28	.28	.23	.28	.23
Cyanide, 110 lb. cases.....lb.	.55	.57½	.55	.57½	.57½	.55	.57½	.55
Metabisulfite, 300 lb. bbl...lb.	.12	.13	.12	.13	.13	.12	.13	.11½
Oxalate, bbls.....lb.	.20	.24	.20	.24	.24	.20	.24	.16
Perchlorate, casks wks.....lb.	.11	.12	.11	.12	.12	.11	.12	.11
Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.16	.16½	.16	.16½	.16½	.16	.16½	.16
Prussiate, red, 112 lb keg...lb.	.38	.40	.38	.40	.40	.38	.40	.38
Yellow, 500 lb casks.....lb.	.18½	.21	.18½	.21	.21	.18½	.21	.18½
Tartrate Neut, 100 lb keg..lb.	.....	.21	.....	.21	.21	.21	.51	.51
Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.21	.23	.23	.21	.25	.21
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.05	.04	.05	.04
250 lb bbls.....lb.	.04½	.06	.04½	.06	.06	.04½	.06	.04½
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.03	02½	.03	.02½
Putty, commercial, tubs..100 lb.	.....	.03¼	.....	.03¼	.03¼	.03¼	.03¼	.03¼
Linseed Oil, kegs.....100 lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Pyridine, 50 gal drums.....gal.	1.50	1.75	1.50	1.75	1.75	1.50	1.75	1.50
Pyrites, Spanish cif Atlantic ports bulk.....unit	.13	.13¼	.13	.13¾	.13¾	.13	.13¼	.13
Quebracho, 35% liquid tks....lb.	.02¾	.04	.02¾	.04	.04	.02¾	.04	.03
450 lb bbls c-l.....lb.	.03¼	.03¾	.03¼	.03¾	.03¾	.03¼	.04¼	.03½
35% Bleaching, 450 lb bbl .lb.	.04¼	.05¼	.04¼	.05¼	.04¼	.05¼	.04¼	.05¼
Solid, 63%, 100 lb bales cif..lb.	.05	.05½	.05	.05½	.05½	.05	.05¼	.05¼
Clarified, 64%, bales.....lb.	.....	.05¾	.....	.05¾	.05¾	.05¾	.05¾	.05¾
Quercitron, 51 deg liquid 450 lb bbls.....lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Solid, 100 lb boxes.....lb.	.09½	.13	.09½	.13	.13	.09½	.13	.10
Bark, Rough.....ton	.....	14.00	.....	14.00	14.00	14.00	14.00	14.00
Ground.....ton	34.00	35.00	34.00	35.00	35.00	34.00	35.00	34.00
R Salt, 250 lb bbls wks.....lb.	.40	.44	.40	.44	.45	.40	.46	.44
Red Sanders Wood, grd bbls..lb.	.....	.18	.....	.18	.18	.18	.18	.18
Resorcinol Tech, cans.....lb.	.90	1.25	.90	1.25	1.25	.90	1.25	1.15
Rosin Oil, 50 gal bbls, first run .....gal.	.56	.58	.56	.58	.58	.56	.62	.57
Second run.....gal.	.59	.61	.59	.61	.61	.59	.64	.60
Rosin								
Rosins 600 lb bbls 280 lb...unit								
B.....	4.50	4.95	4.50	4.95	7.75	5.35	9.25	7.45
D.....	4.70	5.10	4.70	5.10	8.00	5.50	9.25	7.70
E.....	4.85	5.30	4.85	5.30	8.17	5.52½	9.27	8.30
F.....	5.05	5.35	5.05	5.35	8.45	5.55	9.27	8.40
G.....	5.15	5.40	5.15	5.40	8.45	5.60	9.45	8.40
H.....	5.20	5.53½	5.20	5.53½	8.55	5.60	9.50	8.40
I.....	5.25	5.57½	5.25	5.57½	8.58	5.62½	9.50	8.40
K.....	5.40	5.65	5.40	5.65	8.65	5.62½	9.55	8.45
M.....	5.65	5.85	5.65	5.85	8.80	5.65	9.85	8.50
N.....	6.15	6.40	6.15	6.40	8.95	6.05	10.30	8.93
WG.....	7.65	7.80	7.65	7.80	9.25	6.85	11.30	9.00
WW.....	8.40	8.50	8.40	8.50	9.85	7.85	12.30	9.30
Rotten Stone, bags mines....ton	24.00	20.00	24.00	20.00	30.00	18.00	30.00	24.00
Lump, imported, bbls.....lb.	.05	.07	.05	.07	.07	.05	.08	.05
Selected bbls.....lb.	.09	.12	.09	.12	.12	.09	.12	.09
Powdered, bbls.....lb.	.02	.05	.02	.05	.05	.02	.05	.02
Sago Flour, 150 lb bags.....lb.	.04½	.05	.04½	.05	.05	.04½	.05	.04½
Sal Soda, bbls wks.....100 lb.	....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Salt Cake, 94-96% c-l wks. .ton	15.50	19.00	15.50	19.00	24.00	15.50	24.00	19.00
Chrome .....ton	14.50	17.00	14.50	17.00	25.00	14.50	21.00	12.00
Saltpetre, double refd granular 450-500 lb bbls.....lb.	.06½	.06¾	.06½	.06¾	.06¾	.06½	.06¼	.06½
Satin, White, 500 lb bbls.....lb	.....	.01½	.....	.01½	.01½	.01½	.01¼	.01½
Shellac Bone dry bbls.....lb.	.28	.29	.28	.29	.47	.28	.61	.47
Garnet, bags.....lb.	.24	.26	.24	.26	.40	.24	.45	.40
Superfine, bags.....lb.	.19	.22	.19	.22	.39	.20	.47	.39
T. N. bags.....lb.	.....	.17	.....	.17	.34	.18	.44	.36
Schaeffer's Salt, kegs.....lb.	.53	.57	.53	.57	.57	.53	.57	.53
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	11.00	8.00	11.00	8.00
Refined, floated bags.....ton	22.00	30.00	22.00	30.00	30.00	22.00	30.00	22.00
Air floated bags.....ton	.....	32.00	.....	32.00	32.00	32.00	32.00	32.00
Extra floated bags.....ton	32.00	40.00	32.00	40.00	40.00	32.00	40.00	32.00
Soapstone, Powdered, bags f. o. b. mines.....ton	15.00	22.00	15.00	22.00	22.00	15.00	22.00	15.00
Soda								
Soda Ash, 58% dense, bags c-l wks.....100 lb.	.....	1.17½	.....	1.17½	1.40	1.40	1.40	1.40
58% light, bags.....100 lb.	.....	1.15	.....	1.15	1.34½	1.34½	1.34½	1.34½
Contract, bags c-l wks.100 lb.	.....	.....	.....	.....	1.32	1.32	1.32	1.32
Soda Caustic, 76% grnd & flake drums.....100 lb.	.....	2.90	.....	2.90	3.35	3.00	3.35	3.35
76% solid drs.....100 lb.	.....	2.50	.....	2.50	2.95	2.90	2.95	2.95
Sodium Acetate, tech....450 lb. bbls wks.....lb.	.04½	.05	.04½	.05	.05½	.04	.06¾	.04¾
Arsenate, drums.....lb.	.18	.19	.18	.19	.19	.18	.19	.18
Arsenite, drums.....gal.	.50	.75	.50	.75	1.00	.50	1.50	.75
Bicarb, 400 lb bbl NY..100 lb.	.....	.....	.....	.....	2.41	2.41	2.41	2.41

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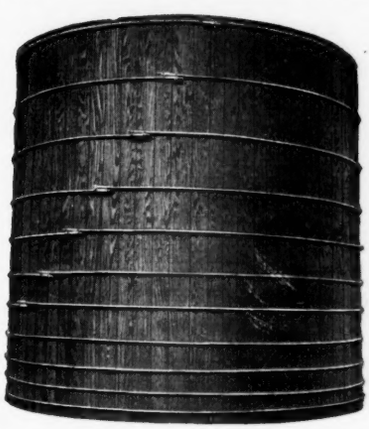

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

dence on the question of prices. Producers appeared willing to make liberal concessions on either spot or contract quantities.

Sulfur — Shipments have shown a decided improvement in the past month. The price situation remained unchanged. Agitation in Texas for a tax on sulfur created interest in the trade according to the annual report of the Obligatory Sicilian Sulphur Consortium, sulfur production from August, 1929, to July, 1930, inclusive, totaled 246,955 tons. This output represents about 7 per cent increase over the 1928-29 production, and follows a similar increase during 1928-29 as compared with 1927-28. Stocks of sulfur with the Consortium on July 31, 1930, totaled 58,868 tons as compared with only 35,288 tons at the close of the year 1928.

Tallow — Routine sales were made at prices in line with the published quotations but with the larger buyers out of the market little in the way of change was reported from the leading factors.

Tanning Materials — The market in natural dyestuffs was a very quiet one during the month. Offerings from the primary markets were small, the result of almost negligible interest on the part of consumers in this country for several months. As a consequence actual stocks are small. In the case of Divi Divi, some concessions were being made whenever actual sales seemed likely and the situation in myrobalans continued weak. While the demand for wattle bark was light, dealers and importers were said to be holding offerings at firm prices. Of the total sales of natural dye-stuffs, mordants and assistants, tanning materials, and of sizes by manufacturer in the United States in 1929, 66.5 percent, or $24,907,000 worth, was sold to industrial consumers; 24.5 percent, or $9,193,000, to dealers, and 9 percent, or $3,379,000, through the manufacturers' own sales offices. The entire sales of these items in 1929 aggregated $37,479,000, according to the census of manufacturers of the Census Bureau. Sales by twenty-four plants manufacturing nothing but tanning material totaled $9,633,499, while total sales of natural dyestuffs, by eight plants amounted to $2,279,000. Sales of mordants and assistants and sizes, by seventy-ty-three plants were $20,287,000.

Toluol — Effective January 12, the price of this commodity was reduced 1c a gal. On January 18 an additional 1c reduction was made, the new level being based on 28c. While the rubber factories were more active in the last three weeks the increased production has failed as yet to influence the toluol market. It is expected however, that stocks in the hands

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Bichromate, 500 lb cks wks lb.	.07	.07½	.07	.07½	.07½	.07	.07¼	.07
Bisulfite, 500 lb bbl wks lb.	.....	.04	.....	.04	.04	.04	.04	.04
Carb. 400 ib bbls NY 100 lb.	.....	2.30	.....	2.30	2.30	2.30	1.35	1.30
Chlorate, ... wks lb.	.05¾	.07¾	.05¾	.07¾	.08	.05¾	.11	.06¼
Chloride, technical ton	12.00	13.00	12.00	13.00	13.00	12.00	13.00	12.00
Cyanide, 96-98%, 100 & 250 lb drums wks lb.	.16	.17	.16	.17	.20	.16	.20	.18
Fluoride, 300 lb bbls wks lb.	.08½	.08½	.08½	.08½	.09	.08½	.09	.08½
Hydrosulfite, 200 lb bbls f. o. b. wks lb.	.22	.24	.22	.24	.24	.22	.24	.22
Hypochloride solution, 100 lb cbys lb.	.....	.05	.....	.05	.05	.05	.05	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks 100 lb.	2.40	3.00	2.40	3.00	3.00	2.40	3.05	2.50
Technical, regular crystals 375 lb bbls wks 100 lb.	2.50	2.65	2.50	2.65	2.65	2.50	2.65	2.40
Metanilate, 150 lb bbls lb.	.44	.45	.44	.45	.45	.44	.45	.45
Monohydrate, bbls lb.	.....	.02½	.....	.02½	.02½	.02½	.02½	.02½
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.57	.52	.57	.54
Nitrate, 92%, crude, 200 lb bags c-1 NY 100 lb.	.....	2.02	.....	2.02	2.22½	1.99	2.22½	2.09
Nitrite, 500 lb bbls spot lb.	.07¼	.08	.07¼	.08	.08	.07¼	.08	.07½
Orthochlorotoluene, sulfonate, 175 lb bbls wks lb.	.25	.27	.25	.27	.27	.25	.27	.25
Oxalate Neut, 100 lb kegs lb.	.37	.42	.37	.42	.42	.37	.42	.37
Perborate, 275 lb bbls lb.	.18	.20	.18	.20	.20	.18	.22	.18
Phosphate, di-sodium, tech. 310 lb bbls 100 lb.	2.65	3.00	2.65	3.00	3.25	2.65	3.55	3.25
tri-sodium, tech, 325 lb bbls 100 lb.	3.25	3.50	3.25	3.50	4.00	3.25	4.00	3.90
Picramate, 100 lb kegs lb.	.69	.72	.69	.72	.72	.69	.72	.69
Prussiate, Yellow, 350 lb bbl wks lb.	.11½	.12	.11½	.12	12½	.11½	.12½	.12
Pyrophosphate, 100 lb keg lb.	.15	.20	.15	.20	.20	.15	.20	.15
Silicate, 60 deg 55 gal drs, wks 100 lb.	.....	1.65	.....	1.65	1.65	1.65	1.65	1.65
40 deg 55 gal drs, wks 100 lb.	.70	.80	.70	.80	.80	.70	.80	.70
Silicofluoride, 450 lb bbls NY lb.	.04	.04¾	.04	.04¾	.05½	.04	.05½	.05
Stannate, 100 lb drums lb.	.21	.24	.21	.24	.43	.24	.43	.38
Stearate, bbls lb.	.20	.25	.20	.25	.29	.20	.29	.25
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.18	.16	.18	.16
Sulfate Anhyd, 550 lb bbls c-1 wks lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02¼
Sulfide, 80% crystals, 440 lb bbls wks lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02¼
62% solid, 650 lb drums 1c-1 wks lb.	.03	.03¼	.03	.03¼	.03¼	.03	.04	.03¼
Sulfite, crystals, 400 lb bbls wks lb.	.03	.03¼	.03	.03¼	.03¼	.03	.03¼	.03
Sulfocyanide, bbls lb.	.28	.35	.28	.35	.35	.28	.76	.28½
Tungstate, tech, crystals, kegs lb.	.81	.88	.81	.88	.88	.81	1.40	.88
Solvent Naphtha, 110 gal drs wks gal.	.30	.38	.30	.38	.40	.30	.40	.35
Spruce, 25% liquid, bbls lb.	.....	.01¾	.....	.01¾	.01¾	.01¾	.01¾	.01¾
25% liquid, tanks wks lb.	.....	.01	.....	.01	.01	.01	.01	.01
50% powd, 100 lb bag wks lb.	.02	.02¼	.02	.02¼	.02¼	.02	.02¼	.02
Starch, powd., 140 lb bags 100 lb.	3.42	3.52	3.42	3.52	4.02	3.42	4.12	3.82
Pearl, 140 lb bags 100 lb.	3.22	3.72	3.22	3.72	3.92	3.32	4.02	3.72
Potato, 200 lb bags lb.	.05½	.06	.05½	.06	.06½	.05½	.06¾	.05¾
Imported bags lb.	.05¾	.06¼	.05¾	.06¼	.06¼	.05¾	.06¾	.05¾
Soluble lb.	.08	.08½	.08	.08½	.08½	.08	.08½	08
Rice, 200 lb bbls lb.	.09	.10	.09	.10	.10	.09	.10	.09½
Wheat, thick bags lb.	.06½	.07	.06½	.07	.07	.06½	.07	.06¼
Thin bags lb.	.09½	.10	.09½	.10	.10	.09½	.10	.09½
Strontium carbonate, 600 lb bbls wks lb.	.07½	.07½	.07¼	.07½	.07½	.07½	.07½	.07¼
Nitrate, 600 lb bbls NY lb.	.09	.09½	.09	.09¼	.09½	.09	.09¼	.08¾
Peroxide, 100 lb drs lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Sulfur								
Sulfur Brimstone, broken rock, 250 lb bag c-1 100 lb.	.....	2.05	.....	2.05	2.05	2.05	2.05	2.05
Crude, f. o. b. mines ton	18.00	19.00	18.00	19.00	19.00	18.00	19.00	18.00
Flour for dusting 99½%, 100 lb bags c-1 NY 100 lb.	.....	2.40	.....	2.40	2.40	2.40	2.40	2.40
Heavy bags c-1 100 lb.	.....	2.50	.....	2.50	2.50	2.50	2.50	2.50
Flowers, 100%, 155 lb bbls c-1 NY 100 lb.	.....	3.45	.....	3.45	3.45	3.45	3.45	3.45
Roll, bbls 1c-1 NY 100 lb.	2.65	2.85	2.65	2.85	2.85	2.65	2.85	2.65
Sulfur Chloride, red, 700 lb drs wks lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Yellow, 700 lb drs wks lb.	.03½	.04½	.03½	.04½	.04½	.03½	.04½	.03½
Sulfur Dioxide, 150 lb cyl lb.	.07	.07½	.07	.07½	.07½	.07	.08½	.07
Extra, dry, 100 lb cyl lb.	.10	.12	.10	.12	.12	.10	.19	.10
Sulfuryl Chloride, 600 lb dr lb.	.10	.65	.10	.65	.65	.10	.65	.10
Talc, Crude, 100 lb bgs NY ton	12.00	15.00	12.00	15.00	15.00	12.00	15.00	12.00
Refined, 100 lb bgs NY ton	16.00	18.00	16.00	18.00	18.00	16.00	18.00	16.00
French, 220 lb bags NY ton	18.00	22.00	18.00	22.00	22.00	18.00	25.00	18.00
Refined, white, bags ton	35.00	40.00	35.00	40.00	40.00	35.00	45.00	35.00
Italian, 220 lb bags NY ton	40.00	50.00	40.00	50.00	50.00	40.00	50.00	40.00
Refined, white, bags ton	50.00	55.00	50.00	55.00	55.00	50.00	55.00	50.00
Superphosphate, 16% bulk, wks ton	8.00	9.00	8.00	9.00	9.50	8.00	10.00	9.00
Triple bulk, wks unit	.....	.65	.....	.65	.65	.65	.....	.....
Tankage Ground NY unit	.....	3.20&10	.....	3.20&10	4.00&10	3.20&10	4.50&10	4.00&10
High grade f.o.b. Chicago unit	.....	3.25&10	.....	3.25&10	3.85&10	3.25&10	4.80&10	3.75&10
South American cif unit	.....	3.40&10	.....	3.40&10	4.25&10	3.40&10	4.80&10	4.35&10
Tapioca Flour, high grade bgs lb.	.03	.03½	.03	.03½	.05¾	.03	.05¾	.04½
Medium grade, bags lb.	.02½	.04¼	.02½	.04¼	.04¼	.02½	.04¼	.03¾
Tar Acid Oil, 15%, drums gal.	.24	.25	.24	.25	.27	.24	.27	.26
25% drums gal.	.26	.28	.26	.28	.30	.26	.30	.29

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

of consumers are low and that better inquiry will shortly be in evidence.

Tin Salts — With the tin market in a more settled condition during the last two weeks of December, tin crystals and tetrachloride prices were increased on January 1 to 25½c and 18¾c respectively.

Titanium Pigments — The reductions announced several weeks ago resulted definitely in placing the market in a much firmer position and while sales were rather light prices were firmly held in all quarters.

OILS AND FATS

Chinawood Oil — Unsettled conditions in the local market and on the Pacific Coast brought about further weakness and price cutting on sales of large volume. A decided flurry in buying in the last week of the month on the Coast was reported as caused by speculative interests and that the sales did not aid in eliminating unwieldy stocks.

Cocoanut Oil — Better inquiry was noted in the local market and several sales of large size were reported. The price situation remained unchanged as stocks are more than ample for immediate needs.

Cod Oil — The trend of the market was downward with trading restricted to small replacement lots. The change for the better which was anticipated in several quarters with the turn of the year failed to materialize during January.

Cottonseed Oil — While trading was comparatively light throughout the month and the primary market lacked evidence of speculative interest prices showed a firmer tendency as the month closed. With improvement in other commodity markets and in the stock market, leading factors in the industry were more optimistic as to the future outlook on prices. Actual sales did not reflect this spirit however and the principal buyers were not making commitments very far into the future.

Zinc — Trading during the month was merely routine with the price range fluctuating within narrow limits but generally lower for the period of the month. Stocks are large and little improvement is possible until the surplus is assimilated in the trade.

Corn Oil — Crude remained in a quiet demand with further concessions of an additional ⅛c offered to stimulate sales. With the grain market fluctuating violently, further price changes were expected shortly.

Degras — Inquiries were in greater volume with several sales of fair volume reported.

	Current Market	1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Terra Alba Amer. No. 1, bgs or bbls mills....100lb.	1.15	1.75	1.15	1.75	1.75	1.15	1.75	1.15
No. 2 bags or bbls...100lb.	1.50	2.00	1.50	2.00	2.00	1.50	2.00	1.50½
Imported bags.....lb.	.01½	.01½	.01½	.01½	01½	.01½	.02½	.01
Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09	.09½	09½	.09	.09½	.09
Tetralene, 50 gal drs wks.....lb.	.....	.20	.....	20	20	.20	.20	.20
Thiocarbanilid, 170 lb bbl....lb.	.26½	.28½	.26½	.28½	.28½	.22	.24	.22
Tin Bichloride, 50% soln, 100 lb bbls wks.....lb.	.....	.12½	.....	12¾	.12¾	.12¼	.14¼	.13½
Crystals, 500 lb bbls wks...lb.	.25	.28½	.25	28½	.34	.25	.38	.33
Metal Straits NY.....lb.	.25⅝	.26	.25⅝	26	.38	.26	.48	.39
Oxide, 300 lb bbls wks.....lb.	.25	.29	25	29	.42	.25	.56	.42
Tetrachloride, 100 lb drs wks. .....lb.	.....	.18½	.....	18½	.20½	.18½	.30½	.27½
Titanium Dioxide 300 lb bbl..lb	.21	.22	.21	22	.50	.21	.50	.22
Pigment, bbls.....lb.	06½	.07½	.06½	07½	.07½	.06½	.14	.07½
Toluene, 110 gal drs.....gal.	....	.34	.....	.34	.40	.35	.45	.45
8000 gal tank cars wks....gal.	.28	.30	.28	30	.35	.30	.40	.40
Toluidine, 350 lb bbls.....lb.	.90	.94	.90	.94	.94	.90	.94	.90
Mixed, 900 lb drs wks.....lb.	.27	32	.27	32	.32	.27	.32	.31
Toner Lithol, red, bbls.....lb.	.90	.95	.90	.95	.95	.90	.95	.85
Para, red, bbls.....lb.	.....	.80	.....	.80	.80	.80	.80	.70
Toluidine .....lb.	1.50	1.55	1.50	1.55	1.55	1.50	1.55	1.50
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	36	.36	.32	.36	.32
Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10	10½	.10½	.10	.10½	.10
Triethanolamine, 50 gal drs...lb.	.40	.42	.40	42	.42	.40	.60	.55
Tricresyl Phosphate, drs.....lb.	.33	.45	.33	.45	.45	.33	.45	.33
Triphenyl guanidine.....lb.	.58	.60	.58	60	.60	.58	.70	.58
Phosphate, drums.....lb.	.60	70	60	70	.70	.60	.75	.60
Tripoli, 500 lb bbls.....100 lb.	.75	2.00	.75	2.00	2.00	1.75	2.00	1.75
Turpentine Spirits, bbls.....gal.	.43½	.43½	.43¾	43½	.61½	.41	.65	.51½
Wood Steam dist. bbls....gal.	.37	.39	37	.39	.52	.36	.57	.49
Urea, pure, 112 lb cases.....lb	.15	.17	.15	.17	.17	.15	.30	.15
Fert. grade, bags c.i.f. ....ton	....	108.00	.....	108.00	108.00	108.00	105.00	98.00
c. i. f. S. points.....ton	.....	109.30	.....	109.30	109.30	109.30	106.30	99.30
Valonia Beard, 42%, tannin bags.....ton	.....	40.00	.....	40.00	40.00	39.50	55.00	42.00
Cups, 30-31% tannin.....ton	24.00	25.00	24.00	25.00	27.00	24.00	35.00	30.00
Mixture, bark, bags.....ton	30.00	31.00	30.00	31.00	32.50	30.00	43.00	35.00
Vermillion, English, kegs....lb..	1.75	1.80	1.75	1.80	2.05	1.75	2.05	2.00
Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Wattle Bark, bags.....ton	40.00	41.00	40.00	41.00	47.75	40.00	49.75	43.50
Extract 55%, double bags ex-dock.....lb.	.05⅞	.06½	.05⅞	.06½	.06½	.05⅞	.06½	.06½
Whiting, 200 lb bags, c-l wks .....100 lb.	.....	1.00	.....	1.00	1.00	1.00	1.25	1.00
Alba, bags c-1 NY.....ton	.....	13.00	.....	13.00	13.00	13.00	13.00	13.00
Gilders, bags c-1 NY...100 lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Xylene, 10 deg tanks wks. .gal.	.....	.28	.....	.28	.31	.28	.33	.33
Commercial, tanks wks...gal.	.25	.30	.25	.30	.33	.25	.32	.30
Xylidine, crude.....lb.	.....	.37	.....	.37	.38	.37	.38	.38

Zinc

Zinc Ammonium Chloride powd., 400 lb bbls.....100 lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Carbonate Tech, bbls NY..lb.	.10½	.11	.10½	.11	.11	.10½	.11	.10½
Chloride Fused, 600 lb drs. wks.....lb.	.05¾	.06	.05¾	.06	.06	.05¾	.06	.05¾
Gran., 500 lb bbls wks.....lb.	.05¾	.06	.05¾	.06	.06½	.05¾	.06½	.06½
Soln 50%, tanks wks...100 lb.	2.25	3.00	2.25	3.00	3.00	2.25	3.00	3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.41	.38	.41	.40
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Dust, 500 lb bbls c-1 wks...lb.	.06	.07	.06	.07	.11	.06	.08½	.08½
Metal, high grade slabs c-1 NY.....100 lb.	4.40	4.45	4.40	4.45	6.45	4.10	6.45	6.45½
Oxide, American bags wks..lb.	.06½	.07	.06½	.07	.07½	.06½	.07½	.07
French, 300 lb bbls wks...lb.	.09½	.11½	.09½	.11½	.11½	.09½	.11½	.09½
Perborate, 100 lb drs.....lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Peroxide, 100 lb drs.....lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Stearate, 50 lb bbls.....lb.	.20	.23	.20	.23	.26	.20	.26	.25
Sulfate, 400 bbl wks.....lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Sulfide, 500 lb bbls.....lb.	.16	.16½	.16	.16½	.32	.16	.32	.30
Sulfocarbolate, 100 lb keg..lb.	.28	.30	.28	.30	.30	.28	.30	.28
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.03	.02½	.03	.02½
Pure kegs.....lb.	.45	.50	.45	.50	.50	.45	.50	.45
Semi-refined kegs.....lb.	.08	.10	.08	.10	.10	.08	.10	.08

Oils and Fats

Castor, No. 1, 400 lb bbls.....lb.	.11½	.12	.11½	.12	.13½	.11½	.13½	.13
No. 3, 400 lb bbls.....lb.	.11¼	.11¾	.11¼	.11¾	.13	.11	.13	.12½
Blown, 400 lb bbls.....lb.	.13¼	.14	.13¾	.14	.15	.12	.15	.14
China Wood, bbls spot NY...lb.	.07	.07½	.07	.07½	.13	.07	.16	.14½
Tanks, spot NY.....lb.	.06	.06½	.06	.06½	.11⅜	.06	.15	.13½
Coast, tanks, ...lb.	.05½	.06¼	.05½	.06¼	.10⅞	.05½	.14¼	.12½
Cocoanut, edible, bbls NY....lb.	.....	.10¾	.....	.10¾	.10¾	.10¾	.10¾	.10¾
Ceylon, 375 lb bbls NY....lb.	.06½	.06½	.06½	.06½	.08¼	.06⅝	.09½	.07⅞
8000 gal tanks NY.....lb.	.05½	.06	.05½	.06	.07	.05½	.08⅜	.06⅜
Cochin, 375 lb bbls NY....lb.	.06¾	.07	.06¾	.07	.09½	.07¼	.10	.09½
Tanks NY.....lb.	.....	.07	.....	.07	.08½	.07	.09¼	.08¾
Manila, bbls NY.....lb.	.06½	.07	.06½	.07	.08¼	.06½	.09½	.07⅞
Tanks NY.....lb.	.04¾	.05	.04¾	.05	.07⅛	.05⅜	.08⅜	.06⅜
Tanks, Pacific Coast.....lb.	.04⅝	.05	.04⅝	.05	.07	.05½	.08	.06⅛

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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - Jan. 1931 $1.284

Linseed Oil — Hand to mouth buying continued throughout the month. While the total volume of sales was large the individual orders were small. Production in the United States during the quarter ended December 31 last totaled 127,717,174 pounds, from a crush of 201,106 tons of flaxseed, compared with a production of 182,227,710 pounds and a crush of 278,525 tons in the corresponding quarter of 1929, according to figures compiled by the United States Census Bureau on the basis of returns from twenty-seven mills.

Stocks of flaxseed at mills on December 31 amounted to 120,489 tons, compared to 121,782 tons at the same date in 1929, and stocks of linseed oil reported by the crushers were 78,097,013 pounds, as compared with 99,738,526 pounds.

Imports of flaxseed during the fourth quarter of 1930 amounted to 21,114 tons, compared with 155,616 tons in the corresponding quarter of the preceding year, while imports of linseed oil were 16,752 pounds, compared with 3,290,629 pounds.

Menhaden Oil — An easier tone prevailed in the primary markets and while published prices were held in small lot trading large tonnages could be had at slight concessions.

Neatsfoot Oil — The market showed a steady tone during the last three weeks of the month and producers and second-hands were holding firm on their price ideas.

Olive Oil — Better inquiry was noted for foots as the soap industry showed signs of renewed buying. The oil sales were limited strictly to replacement of stocks and prices moved within a very narrow range.

Palm Oil — The market had a rather unsettled tone during the month. Actual offerings were light, but buyers were out of the market except to replenish depleted stocks.

Perilla Oil — Prices abroad were steady and no additional concessions were made by importers in an effort to move accumulated stocks. Quotations of 6¼-6½c for future shipments were the ruling prices for fair sized contracts.

Red Oil — To counterbalance the drop in raw materials leading producers of the oil offered material at prices slightly lower than those quoted at the end of the year.

Soybean Oil — Domestic producers advanced the tankcar price slightly as sales showed some improvement over December. Importers held to former quotations.

Sperm Oil — Trading was in light volume at unchanged prices.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cod, Newfoundland, 50gal bbls ....gal.	.42	.44	.42	.44	.56	.46	.64	.57½
Tanks NY....gal.	.39	.40	.39	.40	.62	.48	.60	.60
Cod Liver see Chemicals.....								
Copra, bags....lb.	.....	.039	.....	.039	.046	.039	.05½	.042
Corn, crude, bbls NY....lb.	.....	.09	.....	.09	.10	.08½	.10¾	.09½
Tanks, mills....lb.	.07	.07½	.07	.07½	.08	.06½	.09½	.07¼
Refined, 375 lb bbls NY....lb.	.10½	.10¾	.10¼	.10¾	.10½	.09¾	.11¼	.10¼
Tanks....lb.	.08¾	.08¾	.08¼	.08¾	.10	.08	.11	.09
Cottonseed, crude, mill....lb.	.06½	.07	.06½	.07	.07½	.06½	.09	.08½
PSY 100 lb bbls spot....lb.	.076	.08	.076	.08	.088	.076	.1075	.085
Jan.... ....lb.	.....	.072	.....	.072	.095	.073	.1080	.088
Degras, American, 50 gal bbls NY....lb.	.03½	.04¼	.03½	.04¼	.04¼	.03½	.05	.03½
English, brown, bbls NY....lb.	.04½	.05	.04½	.05	.05	.04¼	.05¾	.04¼
Light, bbls NY....lb.	.05	.05¼	.05	.05½	.05½	.05	.05¼	.05
Dog Fish, Coast Tanks....gal.	.....	.32	.....	.32	.34	.32		
Greases								
Greases, Brown....lb.	.03⅞	.04¼	.03⅞	.04¼	.06½	.04	.08½	.06
Yellow....lb.	.03	.04	.03	.04	.07⅛	.03⅞	.08½	.06½
White, choice bbls NY....lb	.05	.05½	.05	.05½	.08¾	.06	.11¼	.07½
Herring, Coast, Tanks....gal.	.....	Nom.	.....	Nom.	.....	.....		
Horse, bbls....lb.	.05½	Nom.	.05½	Nom.	Nom.	.05½	Nom.	.....
Lard Oil, edible, prime....lb.	.12¾	.13	.12¾	.13	.13¾	.12½	.15½	.14¾
Extra, bbls....lb.	.09½	.10	.09½	.10	.12	.10	.13½	.12
Extra No. 1, bbls....lb.	.09	.09¾	.09	.09¾	.11	.09¾	.13¼	.11¼
Linseed, Raw, five bbl lots...lb.	.096	.102	.096	.102	.146	.096	.162	.105
Bbls c-l spot....lb.	.092	.098	.092	.098	.142	.092	.158	.101
Tanks....lb.	.086	.092	.086	.092	.134	.086	.15	.093
Menhaden Tanks, Baltimore..gal.	.21	.22	.21	.22	.50	.21	.52	.45
Blown, bbls NY....lb.	.07½	.08	.07½	.08	.09	.07½	.09	.09
Extra, bleached, bbls NY..gal.	.52	.53	.52	.53	.70	.52	.70	.70
Light, pressed, bbls NY...gal.	.36	.38	.36	.38	.64	.36	.64	.65
Yellow, bleached, bbls NY.gal.	.38	.40	.38	.40	.67	.38	.67	.66
Mineral Oil, white, 50 gal bbls ....gal.	.40	.60	.40	.60	.60	.40	.60	.40
Russian, gal....gal.	.95	1.00	.95	1.00	1.00	.95	1.00	.95
Neatsfoot, CT, 20° bbls NY .lb.	.15½	.16	.15½	.16	.17⅝	.16½	.19	.18½
Extra, bbls NY....lb	.09½	.10	.09½	.10	.11½	.09½	.13½	.12
Pure, bbls NY....lb.	.11½	.12	.11¼	.12	.13½	.11½	.15½	.13½
Oleo, No. 1, bbls NY....lb.	.07⅞	.08	.07⅞	.08	.12½	.08⅞	.11½	.10⅞
No. 2, bbls NY.... ..lb.	.07	.08	.07	.08	.11	.08½	.11½	.10
No. 3, bbls NY....lb.	.08	.09	.08	.09	.10½	.09	.10½	.09½
Olive, denatured, bbls NY...gal.	.....	.85	.....	.85	1.00	.70	1.40	1.05
Edible, bbls NY....gal.	1.75	2.00	1.75	2.00	2.00	1.75	2.00	1.95
Foots, bbls NY....lb.	.06½	.06¾	.06½	.06¾	.08	.06	.11½	.08½
Palm, Kernel, Casks....lb.	.06	.06¼	.06	.06½	.08½	.06	.09	.08
Lagos, 1500 lb casks....lb.	.05½	.06	.05½	.06	.07¾	.05½	.09	.07¼
Niger, Casks....lb.	.04¾	.05½	.04¾	.05¼	.07½	.05½	.08¼	.07
Peanut, crude, bbls NY....lb.	.....	Nom.	.....	Nom.	Nom.	.....	Nom.	.....
Refined, bbls NY....lb.	.12	.14	.12	.14	.15	.12	.15	.14½
Perilla, bbls NY....lb.	.10	.11	.10	.11	.14½	.10	.20	.15
Tanks, Coast....lb.	.08	.09	.08	.09	.11¼	.08	.15¼	.13
Poppyseed, bbls NY....gal.	1.70	1.75	1.70	1.75	1.75	1.70	1.75	1.70
Rapeseed, blown, bbls NY...gal.	.71	.73	.71	.73	1.00	.74	1.04	1.04
English, drms. NY....gal.	.....	.75	.....	.75	.82	.75	.90	.82
Japanese, drms. NY....gal.	.56	.58	.56	.58	.70	.56	.88	.72
Red, Distilled, bbls....lb.	.08¾	.09	.08¾	.09	.10¾	.08¾	.11¾	.10¼
Tanks....lb.	.07½	.08¼	.07½	.08¼	.09¼	.07¾	.10½	.09¼
Salmon, Coast, 8000 gal tks..gal.	.....	Nom.	.....	Nom.	.44	.42	.44	.42
Sardine, Pacific Coast tks...gal.	.18	.19	.18	.19	.42	.18	.51	.45
Sesame, edible, yellow, dos...lb.	.09½	.10¾	.09½	.10¾	.12	.09	.12	.11½
White, dos....lb.	.....	.10	.....	.10	.12½	.10	.12½	.12¼
Sod, bbls NY....gal..	.....	.40	.....	.40	.40	.40	.40	.40
Soy Bean, crude....								
Pacific Coast, tanks....lb.	.07	.08	.07	.08	.09½	.07	.10¾	.09
Domestic tanks, f.o.b. mills, ...lb.	.067	.07	.067	.07	.08½	.07	.10½	.08½
Crude, bbls NY....lb.	.073	.08	.073	.08	.10¾	.10	.12¾	.11¼
Tanks NY....lb.	.074	.08	.074	.08	.09¾	.09	.11½	.10¼
Refined, bbls NY....lb.	.08	.09	.08	.09	.13½	.13	.13½	.13¼
Sperm, 38° CT, bleached, bbls NY....gal.	.84	.85	.84	.85	.85	.84	.85	.84
45° CT, bleached, bbls NY gal.	.79	.80	.79	.80	.80	.79	.80	.79
Stearic Acid, double pressed dist bags....lb.	.09½	.11	.09½	.11	.15	.13½	.18½	.15½
Double pressed saponified bags ....lb.	.10½	.12	.10½	.12	.15½	.14½	.19	.15¾
Triple, pressed dist bags..lb	.12	.14	.12	.14	.17	.15½	20½	.17¾
Stearine, Oleo. bbls....lb.	.08¼	.08¾	.08¼	.08¾	.09½	.08¼	.12	.09¾
Tallow City, extra loose....lb.	.04¾	.05	.04¾	.05	.07⅜	.04¼	.08⅜	.07
Edible, tierces....lb.	.05½	.06	.05½	.06	.09¼	.05½	.10½	.08
Tallow Oil, Bbls, c-1 NY...lb.	.08¼	.08¾	.08¼	.08¾	.11	.08¼	.12	.10¼
Acidless, tanks NY....lb.	.08¼	.09	.08¼	.09	.10	.08¼	.11	.09¼
Vegetable, Coast mats....lb.	.06½	Nom.	.06½	Nom.	Nom.	.06½	Nom.	.08
Turkey Red, single bbls....lb.	.09	.10	.09	.10	.12	.10	.12	.11
Double, bbls....lb.	.12	.13	.12	.13	.16	.13	.16	.14
Whale, bleached winter, bbls NY....gal.	.....	.74	.....	.74	.74	.74	.80	.74
Extra, bleached, bbls NY..gal.	.77	.77½	.77	.77½	.76	.76	82	.76
Nat. winter, bbls NY.... gal.	.71	.72	.71	.72	.73	.73	.78	.73

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"We"—Editorially Speaking

Of particular significance is the general conclusion that one draws from reading the reviews of the chemical industries in England, France, and Italy in this issue. In each of these respective countries the chemical industry has weathered the period of depression in very favorable shape when comparison is had with other fields. In this they resemble the situation in the United States. The point to bear in mind is that our foreign competitors are in splendid shape and that to meet the competitive situation in the international markets of the world we must be as the saying goes, "on our toes." While the "Old World" may be backward (from our point of view) in adopting many of our pet ideas, they are most certainly not behind the times when we consider chemicals or chemical processes. In the fields of hydrogenation, the so-called "super-fertilizers," high pressure synthesis, synthetic methanol, synthetic alcohol, and in nitrogen fixation we enjoy no monopoly of thought or methods. To the chemical executive in charge of sales, to the manager in the plant, and to the financial interests that make many of our chemical industries possible, there is a timely warning if they but read between the lines.

Even the most routine and uninteresting jobs have their lighter moments. Our Company News Editor recently called to our attention a new incorporation in New Jersey with the name, "Sin," Atlantic City chemists, 125,000 shares, and a correction made by the Delaware State Department, advising that the, "All Cults Academy, Inc.," was incorporated on December 10 for the purpose of teaching "all cults and branches of sciences and literature," and not to handle chemicals as was stated previously. As to the first item, can it be possible that the drug store in question is publicly acknowledging a highly profitable, if not legitimate source of revenue? As to the second the thought comes to mind that after the recent price unpleasantness in the alkali industry that a little training in several cults and branches of the sciences and literature might have helped considerably in guessing what price competitors were quoting pet customers.

If you feel particularly depressed, if you have just heard that the World is going to the "dogs," if it looks as though the old business situation will never change, turn to page 153 and read, "History Repeats Itself". When you are finished you may not be able to look, "At the World Through Rose Colored Glasses" as our leading night-club hostess c-r-o-o-n-s but we will wager you will feel lots better. If we editors would only make a solemn resolve to stop publishing the mass of statistical data that looks so impressive and funeral-like, perhaps the spirit of optimism would spread amongst us much more rapidly. Reading the death notices in the paper is never likely to improve our outlook on life. But never fear, the statistics and graphs, and adverse earning statements will not be neglected. They make too good copy to leave out.

The story of wooden barrels will never be listed as one of the season's "best sellers." Nevertheless, to the plant manager responsible for shipping containers, to the purchasing agent whose duty it is to buy such containers, and to the sales department which is particularly anxious to see that goods sold stay sold and repeat orders follow, Louis F. Horn's article on "Wooden Barrels in the Chemical Industry," contains a definite message of importance. Mr. Horn, secretary for many years for the Associated Cooperage Industries, has reviewed in a very thorough way the various types of wooden barrels and the various uses of each, the approved methods of manufacture, and has included the complete specifications recently adopted for slack and tight barrels. This information will be specially valuable for reference purposes. Due to its length the article is divided into two parts and the second and concluding installment will appear in the March issue.

Glancing through one of our English contemporaries we came upon a letter, rather irate of tone, from an English farmer. His complaint was, that while the fertilizer companies were urging him to use more fertilizer to produce more crops the fertilizer producers were strictly limiting their own production. Of course he missed the point of the advertising entirely and we just wonder if he hasn't the company of thousands in this country who feel the same way. It is rather imperative in the light of the present overproduction of many of the large crops that the farmer should be made to understand quite clearly that what the fertilizer industry is urging is the use of fertilizer to smaller acreages thereby increasing the unit output and the saving of needless labor.

In October, 1930, CHEMICAL MARKETS published an article, "Safety in a Chemical Plant," by George Pickett Stokes, Safety Engineer for the St. Louis plant of Monsanto. The favorable comment received encouraged us to delve a little deeper into the question of safety and safety practices. We talked informally with a number of plant executives and were surprised to find the increase in interest in this important question. Safety, today, is one of the most pressing problems of plant management to the chemical plant executive. While a great deal has been accomplished in correcting the bad name the process industries have had, a great deal more can be done by intelligent application of up-to-date practices. We approached the chemical division of the National Safety Council. With their cooperation we are presenting to our readers a series of articles on safety by a group of engineers covering varying phases of the subject. The first of these articles appears in this issue and is written by George E. Burns. Mr. Burns is a specialist in the field of protective clothing. Previous to his present connection he served for a period of years as an engineering safety inspector with several of the large insurance companies of the United States. During this period he visited one or more units of nearly all important chemical plants of the United States. As a part of his work with the National Safety Council he also has made safety engineering inspections of many chemical plants. These inspections included some of the special investigations which resulted in the publication by the National Safety Council of their Safe Practices Pamphlet on "Pressure Vessels—Fired and Unfired." (Recently published in CHEMICAL MARKETS). Mr. Burns also prepared for the National Safety Council, in cooperation with about 75 leading safety engineers of the United States, a special Safe Practices Pamphlet on "Protective Clothing."

The remaining articles will be published every other month during the present year and will cover such allied subjects as "Safe Handling of Chlorine," "How to Compile and Use Industrial Accident Statistics," "Checking Your Plant and Specifications for Safety."

BY-PRODUCTS

An executive with a clear desk undoubtedly possesses a good assistant.

Now the alkali buyers are beginning to wonder if competitors didn't do better.

The "Alcotate Cocktail" is much better with a dash of geranium oil.

Two trips each to the automobile and motorboat shows should help our training for the Chemical Exposition in May.

How does a chemical executive go about applying for "drought relief?"